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September 2, 2015

Mr. John Urbanic
NISP EIS Project Manager
U.S. Army Corp of Engineers, Omaha District
Denver Regulatory Office
9307 S. Wadsworth Blvd.
Littleton, CO 80128

Via Electronic and Hand Delivery
nisp.eis@usace.army.mil

RE: City of Fort Collins' Comments to the Supplemental Draft Environmental Impact Statement for the Northern Integrated Supply Project

Dear Mr. Urbanic:

Please find attached to this letter detailed comments and associated reference material from the City of Fort Collins regarding the Supplemental Draft Environmental Impact Statement for the Northern Integrated Supply Project. Please make this submission a part of the administrative record in this matter. We respectfully submit these comments for your consideration and look forward to the response of the United States Army Corp of Engineers.

On September 1, 2015, the Fort Collins City Council adopted the attached Resolution directing that these comments be submitted on behalf of the City.

If you have any questions, please feel free to contact me, or you may also John Stokes, City of Fort Collins Natural Areas Department Director, at (970) 221-6263, jstokes@fcgov.com.

Thank you.

Sincerely,

Darin A. Atteberry
City Manager

Attachments:

1. Resolution of the City Council of the City of Fort Collins (Exhibit A omitted).
2. City of Fort Collins Comments on Supplemental Draft Environmental Impact Statement for the Northern Integrated Supply Project, Dated September 2, 2015.

CC:

Fort Collins Mayor and City Council Members
Carrie Daggett, Fort Collins City Attorney
Eric Potyondy, Fort Collins Assistant City Attorney
John Putnam, Kaplan Kirsch & Rockwell LLP
John Stokes, City of Fort Collins Natural Areas Department Director

RESOLUTION 2015-082
OF THE CITY OF FORT COLLINS
DIRECTING THE CITY MANAGER TO SUBMIT TO THE U.S. ARMY CORPS OF ENGINEERS THE CITY'S COMMENTS ON THE SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE NORTHERN INTEGRATED SUPPLY PROJECT

WHEREAS, the Northern Colorado Water Conservancy District ("District") is pursuing the Northern Integrated Supply Project ("NISP"), a water storage and supply project that would divert significant amounts of water from the Cache la Poudre River upstream of Fort Collins; and

WHEREAS, to move forward with the necessary federal permitting for NISP, the District is required by the National Environmental Policy Act ("NEPA") to complete an environmental impact review process, conducted in this case by the U.S. Army Corps of Engineers ("Corps") as the permitting agency under the federal Clean Water Act; and

WHEREAS, as part of the review process, on April 30, 2008, the Corps issued a draft Environmental Impact Statement ("DEIS"), and the City timely submitted comments to the DEIS on September 10, 2008, pursuant to Resolution 2008-002; and

WHEREAS, on June 19, 2015, the Corps issued a supplemental draft Environmental Impact Statement ("SDEIS"), and pursuant to a subsequent extension of time, provided for submission of public comment up to September 3, 2015; and

WHEREAS, at the May 12, 2015, City Council work session, City staff presented background on NISP as well as staff's proposed analytical and data-driven objective approach to commenting on the SDEIS, which approach City Council endorsed; and

WHEREAS, pursuant to the direction of City Council, City staff, working with the assistance of outside technical experts, undertook a thorough and detailed technical analysis of the SDEIS primarily as it pertains to the NISP proposed action and its direct impacts in Fort Collins and to the City; and

WHEREAS, at the July 28, 2015, City Council work session, City staff presented preliminary analyses and findings related to staff's review of the SDEIS; and

WHEREAS, the City wishes to express its support for other communities, including participants in NISP, in their quest to acquire reliable water supplies without significantly adversely affecting other communities and the environment; and

WHEREAS, the City has concluded that the SDEIS is deficient under NEPA and the federal Clean Water Act in various respects, including in its analysis of potential impacts to the City, as set forth in the City's comments to the SDEIS; and

WHEREAS, staff has concluded the project will be harmful to Fort Collins based on a thorough review of the impacts described by the SDEIS as well as the impacts that staff expects from the project; and

WHEREAS, in view of the significance of the impacts that NISP would have on the City and the Fort Collins community, it is in the City's best interest to comment on the SDEIS, to continue to participate in these proceedings, and to monitor the responses to the comments of the City and others.

NOW THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FORT COLLINS as follows:

Section 1. That the City Council cannot support NISP as it is currently described and proposed in the SDEIS, with the understanding that the City Council may reach a different conclusion with respect to a future variant of NISP, such as the proposed Modified Alternative Number 4 as described in the City's comments, if such variant addresses the City's fundamental concerns expressed in the City's comments to the DEIS and comments to the SDEIS.

Section 2. That the City Manager is hereby authorized and directed to submit to the Corps formal comments to the SDEIS that are substantially similar with those attached hereto as Exhibit "A" and incorporated herein by this reference, in accordance with the deadline for such submission.

Passed and adopted at a regular meeting of the Council of the City of Fort Collins this 1st day of September, A.D. 2015.

Mayor

ATTEST:

CITY OF FORT COLLINS SEAL COLORADO

Wanda Winkelmann

City Clerk

Comments on Supplemental Draft Environmental Impact Statement
for the
Northern Integrated Supply Project

Dated: September 2, 2015

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INTRODUCTION AND EXECUTIVE SUMMARY

The City of Fort Collins ("Fort Collins") respectfully files and submits to the United States Army Corps of Engineers ("Corps") these comments to the Supplemental Draft Supplemental Impact Statement, dated June 2015 and issued on June 19, 2015 ("SDEIS"), and its associated technical reports and related documents, regarding the Northern Integrated Supply Project ("NISP" or "Project"), for which the Northern Colorado Water Conservancy District ("Northern" or "District") is the applicant. Reference materials are identified in the comments and the majority of such reference materials are being provided to the Corps in electronic format. These reference materials shall constitute part of these comments. Fort Collins reserves all rights to provide additional and supplemental comments on the SDEIS and/or NISP, as may be appropriate.

To the extent permitted by the short comment period, Fort Collins has completed a thorough, scientific review of the SDEIS by expert City staff and consultants summarized in Appendix A. Several of Fort Collins' concerns regarding the original NISP draft environmental impact statement ("DEIS") remain. The SDEIS has also created new issues under National Environmental Policy Act, 42 U.S.C. §§4321-4370h ("NEPA"), and the rules and regulations and guidelines thereunder, the Clean Water Act, 33 U.S.C. §§1251-1387 ("CWA"), and the rules and regulations and guidelines thereunder, and other relevant legal requirements, as discussed herein. In short, the SDEIS remains inadequate for the Corps to discharge its obligations under these requirements, including its selection of the least environmental damaging practicable alternative ("LEDPA") for the Project. *See* 40 C.F.R. § 230.10(a) ("[N]o discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem …").

If a Section 404 permit under the CWA is awarded for the Project, substantial compensatory mitigation will be needed, in addition to any avoidance and minimization measures. It is Fort Collins' understanding that mitigation for NISP will be finalized with any Record of Decision ("ROD"), and that avoidance and minimization measures may be finalized before the ROD. As discussed further herein, Fort Collins notes that, at this point, the District's plans in these respects, which are summarized in Appendix F of the SDEIS, are conceptual and offer limited information on specific measures. Appendix F indicates the intent of the District to recognize and react constructively to impairment of interests other than those of the District and the NISP participants, to be cooperative and responsive, and to participate in all reasonable efforts to address impairments to resources or interests caused by NISP. Where the document does not define specific limits or features of these commitments, however, it is of limited use except as a statement of general intent. Clarification of these efforts is required by NEPA and the CWA. As the entity most impacted by the Project, Fort Collins would welcome the opportunity to participate in mitigation-related discussion and efforts.

Fort Collins' comments are organized by general topic area. In general, the comments begin with broader, more conceptual concerns regarding the SDEIS and the Project, and thereafter turn to more specific issues. Certain reference materials are cited in the text of the comments and all are listed at the end of the section and in Appendix B. The following is a brief summary.

SECTION 1: Incorporation of Fort Collins Comments to DEIS. The comments included herein are a supplement and in addition to the previous comments made to the original DEIS for the Project. Several issues raised in the DEIS have not been adequately addressed.

SECTION 2: Validity of the No Action Alternative. The SDEIS includes consideration of a "no action" Alternative 1, which purportedly would not require federal action. However, Alternative 1 is developed around the proposed Cactus Hill Reservoir that, based on the information provided, appears to require an individual Section 404 permit under the CWA. If the proposed Cactus Hill Reservoir requires a Section 404 permit, then under NEPA, the Corps must revise its alternatives analysis in a new SDEIS to develop a new, true "no action" alternative that can serve as the baseline for analyzing the proposed action's environmental impact. In violation of NEPA and the CWA, the SDEIS's current "no action" alternative skews the analysis to reduce identified impacts, thereby altering the selection of the LEDPA. If the proposed Cactus Hill Reservoir would not, in fact, require a Section 404 permit under the CWA, the SDEIS must expressly set forth why no such permit is needed.

SECTION 3: Failure to Conduct Analyses on All Environmental Impacts, Failure to Fully Address Cumulative Impacts, and Uncertainty Regarding Mitigation Measures. The SDEIS defers several key analyses of impacts to a later date, namely, quantitative water quality analyses. The failure to provide these analyses violates NEPA and such analyses must be provided to Fort Collins and other stakeholders for review before any determination on the Project can be made. The SDEIS also does not fully describe how the cumulative impacts from NISP, Fort Collins' Halligan Water Supply Project, and Greeley's project to enlarge Milton Seaman Reservoir will be assigned to each project. Additionally, the SDEIS's proposed measures to mitigate the environmental impacts of each alternative are vague and the effectiveness of the mitigation has not been adequately documented at this point in the process.

SECTION 4: Proposed Modified Alternative 4. Fort Collins has investigated a modified Alternative 4 for NISP that would meet the NISP Participant's purpose and need while simultaneously maintaining relatively more water in the Poudre River through Fort Collins than all other action alternatives presented in the SDEIS. Such additional flows through Fort Collins would address many of the concerns identified in these comments. The modified Alternative 4 is contemplated to operate in such a way as to significantly reduce NISP diversions upstream of Fort Collins as compared to Alternative 2 (the District's preferred action), as well as Alternatives 3 and 4, resulting in relatively more stream flows and relatively fewer impacts to aquatic and riparian resources along a 23 mile reach of river through Fort Collins than the other alternatives considered in the SDEIS. The Corps must consider and fully analyze this modified Alternative 4 in its analysis and consideration of NISP.

SECTION 5: Water Quality Comments. The SDEIS was issued without several quantitative analyses that would have allowed Fort Collins to meaningfully analyze possible effects on its interests related to the quality of water Fort Collins treats for its potable water supply, as well as the quality of water in the Poudre River. To comply with NEPA's "hard look" standard and the

Section 404 Guidelines, additional analyses must be performed and the Corps must address the specific deficiencies discussed in these comments.

SECTION 6: Operational Comments. The SDEIS's description of Alternative 2 (the District's preferred alternative) includes a proposed flow augmentation program, and certain descriptions of other NISP operations, such as deliveries to NISP Participants. However, the proposed flow augmentation program is only proposed with Alternative 2, which unjustifiably skews the analysis towards the selection of Alternative 2 as the LEDPA. Both NEPA and Section 404 require equal treatment of all alternatives. Also, as proposed in the SDEIS, the proposed flow augmentation program appears to be premised on various incorrect assumptions and errors and raises various concerns regarding its operations that could undermine its ability to meet its goals to address the impacts to Fort Collins. The SDEIS also lacks needed analysis and specificity on various aspects of the proposed operations regarding Alternative 2.

SECTION 7: Channel Structure, Storm Water, Floodplain, and Hydraulic Comments. While the SDEIS is an improvement over the DEIS, the stream morphology and sediment transport analysis in the SDEIS contain several flaws such that the analysis cannot be used to meaningfully analyze NISP's impacts on Fort Collins in the areas of drainage, storm water, and floodplain impacts. The SDEIS also contains assertions and conclusions that that lack factual bases and are arbitrary, including assertions regarding flushing flows. Revised analyses and considerations are required in order to correctly and meaningfully evaluate the impacts. The mitigation measures outlined in Appendix F do not properly evaluate or estimate the amount of sediment that will accumulate within the river through Fort Collins due to the reduced flow from the Project. This amount of sediment needs to be properly quantified and assigned a mitigation cost.

SECTION 8: Air Quality and Climate Change Comments. Fort Collins is concerned with the adequacy of the air quality and climate change analysis in the SDEIS, as well as the impacts of the proposed action. In general, the SDEIS does not fully analyze these impacts (which include greenhouse gasses), which are understated throughout the document. The Corps has failed to take a hard look at the impacts under NEPA, and the lack of analysis prevents Fort Collins and other stakeholders from meaningfully analyzing these effects. To comply with NEPA and the Clean Air Act conformity regulations, the Corps must conduct revised and additional analyses. The Corps must conduct such analyses and present them for public review and comment in a draft general conformity analysis. Neither the DEIS nor the SDEIS provide a conformity analysis under 40 C.F.R. Part 93, despite the acknowledgement in the SDEIS that it is necessary.

SECTION 9: Recreation and Aesthetics Comments. The SDEIS identifies significant, but does not adequately analyze, impacts on boating opportunities and recreational experiences in Fort Collins. The SDEIS does not provide a full and complete evaluation of the aesthetics impacts from NISP. NEPA requires that the Corps further evaluate and provide additional information on those impacts so that Fort Collins and other stakeholders can meaningfully evaluate them.

SECTION 10: Biological Resources Comments. The SDEIS's unproven assertion that the Poudre River is on a trajectory of inevitable decline is contradicted by the facts. Neither NEPA nor the CWA allow agencies to disregard the impacts of proposed actions by assuming that

environmental resources will be lost regardless. The Poudre River Ecosystem Response Model and the Poudre River Health Assessment Framework can serve as effective guideposts and decision support tools for NISP. The SDEIS fails to include a quantitative temperature analysis, as noted above, which is needed to meaningfully analyze the impacts from NISP on aquatics and fisheries. The SDEIS also relies on oversimplifications and includes assertions that are not based on defined metrics. The SDEIS does not properly assess impacts to the Poudre River's wetlands and riparian areas (including its ground water component). The SDEIS further includes various incorrect assumptions, errors, and inappropriate conclusions, all of which result in under-quantification of the identified impacts of NISP on the Poudre River's wetlands and riparian areas. The SDEIS analyses of impacts to wildlife are inadequate because they are based on the flawed analysis for the Riparian and Wetlands sections of the SDEIS. The Corps must revise these so that Fort Collins and other stakeholders can meaningfully evaluate the impacts.

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SECTION 1: INCORPORATION OF FORT COLLINS' COMMENTS TO DEIS

Fort Collins hereby incorporates by reference its comments on the original DEIS for NISP, including comments on the regulatory framework, which Fort Collins provided on September 10, 2008 ("2008 Comments"). The original DEIS contained flaws that rendered it insufficient under NEPA and the rules and regulations and guidelines thereunder, the CWA, and the rules and regulations and guidelines thereunder, and other relevant legal requirements.

The Corps has addressed some of the comments made by Fort Collins and other stakeholders. However, the SDEIS remains inadequate for the Corps to discharge its obligations under these requirements. Among flaws that carry over from the DEIS and identified in Fort Collins' DEIS comments are:

- Lack of compliance with the CWA requirement to analyze, avoid, and minimize impacts associated with NISP. *See* 2008 Comments at 13-17.
- Failure to provide adequate analysis (including modeling of water quality and other effects) at the DEIS stage. *See* 2008 Comments at 17-22. As discussed below, the SDEIS fails to provide the quantitative analyses of impacts it must provide.
- Failure to properly study and address effects of Total Organic Carbon ("TOC") levels in Horsetooth Reservoir. *See* 2008 Comments at 23-25.
- Flawed and incomplete analysis of the effects of the alternatives on lost peak flows and resulting impacts. *See* 2008 Comments at 26-28.
- Vague and insufficient avoidance, minimization, and mitigation planning and commitments. *See* 2008 Comments at 30-36.

These continuing flaws render the SDEIS inadequate and in violation of NEPA, the CWA, and other relevant legal requirements. As discussed below, the SDEIS also contains new flaws and inadequacies under those laws.

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SECTION 2: VALIDITY OF THE NO ACTION ALTERNATIVE

2.1 THE NO ACTION ALTERNATIVE VIOLATES NEPA AND RENDERS ITS ALTERNATIVES ANALYSIS INVALID

The SDEIS's alternative analysis is flawed and violates NEPA. The analysis of alternatives under NEPA is "the heart of the environmental impact statement." *Or. Natural Desert Ass'n v. Bureau of Land Mgmt.*, 531 F.3d 1114, 1121 (9th Cir. 2008) (quoting 40 C.F.R. § 1502.14). In the SDEIS, the Corps must "[r]igorously explore and objectively evaluate all reasonable alternatives" to that action. 40 C.F.R. § 1502.14(a). An integral component of the alternatives analysis is the Corps' consideration of a no action alternative that serves as "a baseline for measuring the effects of the proposed action." *Biodiversity Conservation Alliance v. United States Forest Serv.*, 765 F.3d 1264, 1269–1270 (10th Cir. 2014). The no action alternative is a measuring stick that highlights the environmental impacts of the proposed action and allows them to be compared to the proposed action's benefit. Without a true no action alternative, there is no accurate baseline for measuring the effects of proposed action in the SDEIS. Thus, the current alternatives analysis for NISP is fundamentally flawed. To comply with NEPA, the alternatives analysis must be revised to include a true no action alternative that accurately serves as the baseline for its NEPA analysis.

2.1.1 The Proposed Cactus Hill Reservoir Requires a Section 404 Permit Under the CWA, and Therefore, Is an Action Under NEPA

Alternative 1 is developed around the proposed Cactus Hill Reservoir as a "no action" alternative. *See* SDEIS at 2-16. However, based on the information in the SDEIS and associated reports, Cactus Hill Reservoir requires a Section 404 permit under the CWA, 33 U.S.C. § 1344, and is an action that would therefore be subject to NEPA review. The treatment of Alternative 1 in the SDEIS as a no action alternative is thus improper and in violation of NEPA.

According to the SDEIS, the proposed Cactus Hill Reservoir component of the no action alternative would be a major construction project that will impact, among other things, 31.8 acres of wetlands, including 1.4 acres of wetlands impacted by fill discharges and 30.4 acres of wetlands that would be inundated by reservoir. *See* NISP Vegetation and Wetland Resources Technical Report at 13–14. Based on this information, Cactus Hill Reservoir would require an individual Section 404 permit and Alternative 1 is therefore an "action" under NEPA.

It is well-established that, under NEPA, the issuance of a Section 404 permit is an "action." *See, e.g., Ramsey v. Kantor*, 96 F.3d 434, 444 (9th Cir. 1996) ("If a federal permit is a prerequisite for a project with adverse impact on the environment, issuance of that permit does constitute major federal action and the federal agency involved must conduct an EA and possibly an EIS before granting it."). *See also Stewart v. Potts*, 996 F. Supp. 668, 672 (S.D. Tex. 1998) (stating that issuance of a Section 404 permit by the Corps is deemed to be a "major Federal action" to which NEPA's mandates apply). *See also, e.g.*, Daniel R. Mandelker, NEPA Law & Litig. § 8:19 (2d ed. 2014) (explaining that "[f]ederal permits" are "typical examples" of major federal action triggering NEPA). Based on the information in the SDEIS and the various technical reports, the treatment of

Cactus Hill Reservoir as a no action alternative—when the project would require a 404 permit and NEPA analysis—is arbitrary and capricious and violates NEPA.

If it is the Corps' position that Cactus Hill Reservoir would not require a Section 404 permit, then the Corps must provide a comprehensive explanation and factual basis for this conclusion—including a delineation of the wetlands on the proposed site of Cactus Hill Reservoir under the Corps' new "waters of the United States rule," 80 Fed. Reg. 37054 (June 29, 2015), and a demonstration why an individual Section 404 permit is unnecessary. The justification would be especially important here, because the Corps' entire alternatives analysis hinges on measuring the impacts of the proposed action against a major construction project with significant wetlands impacts.

The information provided in the SDEIS indicates that the estimated wetland impact caused by the Cactus Hill project would not fall within nationwide permits. For instance, Cactus Hill Reservoir's impacts exceed the Nationwide Permit 18's threshold requirements for minor discharges. 77 Fed. Reg. 10184 at 10202 (Feb. 21, 2012). Also, given that the Corps estimates that Cactus Hill Reservoir would impact 257 acres of wetlands and other waters (SDEIS at S-45), the Project would cause more than minimal individual and cumulative adverse effects on the aquatic environment and would require an individual permit. *See* 33 U.S.C. 1344(e). *See also* 77 Fed. Reg. at 10288.

As further example, the level of wetland impacts, both in terms of fill discharges (1.4 acres) and reservoir inundation (30.4 acres), for construction of Cactus Hill Reservoir for the no action alternative is more than the amount Fort Collins preliminarily estimated as being impacted from the enlargement of Halligan Reservoir, an action for which the Corps is requiring an individual Section 404 permit.

2.1.2 The Failure To Consider A Legitimate No Action Alternative Renders Its Alternatives Analysis Deficient under NEPA and the CWA

The use of Cactus Hill Reservoir as the no action alternative skews its entire analysis of alternatives, in violation of NEPA. The no action alternative is intended to "provide a baseline against which the action alternative" is evaluated." *Ctr. for Biological Diversity v. United States DOI*, 623 F.3d 633, 642 (9th Cir. 2010). Without "[accurate baseline] data, an agency cannot carefully consider information about significant environment impacts … resulting in an arbitrary and capricious decision." *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067,1085 (9th Cir. 2011). *See also Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024, 1038 (9th Cir. 2008) (holding an agency's no action alternative in its NEPA analysis invalid because it improperly defined the baseline); *Openlands v. Dept. of Transport.*, No. 13 C 4950 (N.D. Ill., June 16, 2015)[1] ("The flawed 'no build' analysis also dooms the ROD and EIS'analysis of the direct effects of the proposed Corridor"; same with indirect impacts).

[1]https://scholar.google.com/scholar_case?case=5946396167037980773&q=ILLIANA&hl=en&as_sdt=4006&as_ylo=2015 (last visited August 6, 2015).

The SDEIS tables comparing alternatives illustrate the problem with treating Cactus Hill Reservoir as a no action alternative instead of an action alternative. In its comparison of alternatives, the SDEIS arbitrarily and simultaneously treats Cactus Hill Reservoir as both the no action alternative and as part Alternatives 3 and 4. SDEIS at 2-17, Table 2-3. *See also id*. 2-61. A "no action alternative in an EIS is meaningless if it assumes the existence of the very plan being proposed." *Friends of Yosemite Valley v. Scarlett*, 439 F. Supp. 2d 1074, 1105 (E.D. Cal. 2006). Because Cactus Hill Reservoir is an action that would have significant impacts requiring the Corps' review, it cannot serve as baseline against which the Corps' can compare the preferred alternative (Alternative 2). The consideration of Cactus Hill Reservoir's impacts as a consequence of no action, including environmental effects and financial costs, artificially reduces the significant impacts of the proposed action. This in turn precludes a meaningful alternative analysis and makes it "impossible to accurately isolate and assess the environmental impacts of the [proposed action]." *N.C. Wildlife Fed'n v. N.C. DOT*, 677 F.3d 596, 602 (4th Cir. 2012).

The no action alternative cannot include a project that requires a Corps permit and is an action under NEPA. The treatment of Cactus Hill Reservoir distorts the alternatives analysis and prevents the Corps, other agencies, and the public from "objectively evaluat[ing] all reasonable alternatives" to the proposed action. 40 C.F.R. § 1502.14(a). Further, in arbitrarily treating the Reservoir as both a no action alternative and as a major component of the Alternatives 3 and 4, the District fails to satisfy Section 404(b)(1) Guidelines' high burden imposed on projects that are not water dependent. Because the proposed action is not water dependent, the District must overcome presumption that practicable alternatives that do not involve impacting wetlands are available. *See* 40 CFR § 230.10(a)(3). To satisfy the Guidelines, the District must "clearly demonstrate" no practicable alternatives are available. *Id*. In treating Cactus Hill Reservoir as the no action alternative, the District has failed to rebut that presumption.

To comply with NEPA and the CWA, the Corps must conduct a reevaluation of the alternatives and present that information in a revised or second supplemental DEIS. And that analysis must include a true no action alternative that will serve as the baseline for an accurate and informed alternatives analysis.

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SECTION 3: FAILURE TO CONDUCT ANALYSES ON ENVIRONMENTAL IMPACTS, FAILURE TO FULLY ADDRESS CUMULATIVE IMPACTS, AND UNCERTAINTY REGARDING MITIGATION MEASURES

3.1 THE FAILURE TO CONDUCT AND DISCLOSE ANALYSES ON CERTAIN ENVIRONMENTAL IMPACTS IN THE SDEIS VIOLATES NEPA AND THE CWA

Like the DEIS, the SDEIS defers critical environmental impact analyses to the final environmental impact statement ("FEIS") rather than providing them at the draft stage. For example, the SDEIS provides only incomplete and vague qualitative analysis of critical impact categories like water quality, as discussed further below. *See* SDEIS at 4-85 ("Results of Phase II water quality modeling will be presented in the FEIS") (emphasis added). Additional examples of such deferrals are included in the specific comments below, such as in Section 6.3.7 of these comments (No Analysis of Subsequent Exchanges Using Augmentation Program Flows). In deferring key analyses to a later date, the Corps violates NEPA's mandate that an agency timely "consider every significant aspect of the environmental impact of a proposed action" and "inform the public that it has indeed considered environmental concerns in its decisionmaking process." *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983). The SDEIS falls far short of satisfying either objective by failing to include in the SDEIS analyses of issues that are central to the evaluation of the proposed action.

CEQ regulations governing implementation of NEPA state that a draft impact statement "must fulfill and satisfy to the fullest extent possible the requirements established for final statements in [§ 4332(2)(C) of NEPA]." 40 C.F.R. § 1502.9 (emphasis added). Moreover, the regulations require that an insufficiently detailed DEIS be supplemented or revised: "if a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion." *Id*. (emphasis added). *See also N. Buckhead Civic Ass'n v. Skinner*, 903 F.2d 1533, 1540 (11th Cir. 1990) (it must be ensured that environmental effects will not be "overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast."). To comply with NEPA, the missing analyses must be conducted and included in a revised or second supplemental DEIS. Without that information, the Corps, other state and federal agencies, and the public cannot conduct a fully informed evaluation of NISP and its LEDPA.

3.1.1 A Hard Look at the Environmental Impact of NISP Has Not Been Taken Due to a Failure to Complete All Necessary Evaluations

NEPA "prohibits uninformed agency action." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351, (1989). In preparing the SDEIS, a "hard look" at the environmental consequences of the proposed action and its impacts must be taken. The primary function of this detailed statement is to ensure "a fully informed and well-considered decision." *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519, 558 (1978). The "hallmarks of a 'hard look' are thorough investigation into environmental impacts and forthright acknowledgement of potential environmental harms." *Nat'l Audubon Soc'y v. Dep't of Navy*, 422 F.3d 174, 187 (4th Cir. 2005). Contrary to the principle that "accurate scientific analysis" is

"essential to implementing NEPA," *Sierra Club v. Van Antwerp*, 709 F. Supp. 2d 1254, 1259 (S.D. Fla. 2009), the SDEIS has substantial gaps that are claimed will be filled in later. Delaying environmental review that should be included in the SDEIS violates NEPA.

For example, in the SDEIS, only the qualitative analysis of water quality impacts is provided—stating, without explanation, that the quantitative analysis would be provided in the FEIS. *See* SDEIS at 4-85. The SDEIS indicates that modeling will be conducted to "facilitate the [CWA Section] 401 permitting process" in "coordination with the [Water Quality Control Division ("WQCD")] and the EPA using WQCD protocols." *Id*. at 4-153. However, the obligation to analyze and present impacts at the draft EIS stage is independent under NEPA. No sufficient reason is provided as to why this modeling cannot be completed and included in the SDEIS, or another draft document. WQCD Section 401 protocols are not needed to provide quantitative analysis of impacts in the SDEIS. The CWA Section 401 certification is a wholly separate federal process from the NEPA. It neither supplements the EIS, nor remedies flaws in the NEPA process stemming from the failure to provide the public with all relevant information on the impacts of NISP.

The incomplete analysis on water quality effects in the SDEIS undermines both the intent and expressed requirements of the NEPA. As stated above, NEPA is intended to ensure "accurate scientific analysis" and adequate public involvement. It prevents agencies from making decisions without timely and adequately analyzing the environmental impacts of a project. Thus, NEPA expressly mandates that if there is "incomplete information relevant to reasonably foreseeable significant adverse impacts [that] is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement. 40 C.F.R. § 1502.22. And that information should be provided in the draft EIS. *See* 40 C.F.R. § 1502.9. Here, the fact that plans exist to conduct the requisite water quality modeling at a later date demonstrate that the information is necessary and available; the analyses just need to be prepared. The failure to conduct water quality modeling and other relevant studies and include that information in the SDEIS violates NEPA.

3.1.2 The Failure to Conduct All Relevant Studies Violates NEPA's Requirement That The Public Is Fully Informed Of NISP's Environmental Effects

By deferring certain scientific analyses to a later date, the SDEIS does not satisfy NEPA's requirement that agencies "will have available, and will carefully consider, detailed information concerning significant environmental impacts, and that the relevant information will be made available to the larger [public] audience." *N. Idaho Cmty. Action Network v. U.S. Dept. of Transport.*, 545 F.3d 1147, 1153 (9th Cir. 2008). Because all relevant scientific analyses have not been conducted, the SDEIS is incomplete. In violation of NEPA, this lack of information prevents the "public and other government agencies [from] react[ing] to the effects of a proposed action at a meaningful time." *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 371 (1989). Stated another way, Fort Collins and others are not fully informed about the impacts of NISP, and cannot conduct meaningful review of the proposed action, if the SDEIS itself has not fully evaluated NISP.

Where, as here, the relevant information and scientific analyses are not available to the public for comment, the "[SDEIS] process cannot serve its larger informational role, and the public is

deprived of [its] opportunity to play a role in the decision-making process." *N. Plains*, 668 F.3d at 1085. As the Ninth Circuit states in *Pacific Rivers Council v. United States Forest Service*:

> The scope of its analysis of environmental consequences in [the] EIS must be appropriate to the action in question. NEPA is not designed to postpone analysis of an environmental consequence to the last possible moment. Rather, it is designed to require such analysis as soon as it can reasonably be done.

668 F.3d 609, 623 (9th Cir. 2012). Given the scope, complexity, and many environmental impacts of NISP, and the substantial and varied interests in the project, the Corps must fully assess and provide all relevant information on the impacts before making a decision. The failure to complete all the relevant studies and include them in the SDEIS is in violation of NEPA.

This is especially the case where Fort Collins made very clear in its comments on the DEIS how important water quality and riparian health are to Fort Collins, and Fort Collins informed the Corps that the analyses in the DEIS were vague and qualitative. The DEIS and SDEIS do not accomplish their purpose when they defer real analysis of some of the most critical issues needed for informed decision making.

3.1.3 There Is Insufficient Information to Determine Compliance With Section 404(b)(1) Guidelines and the CWA's Public Interest Review

The failure to conduct all necessary environmental analyses also violates the CWA. Under the Section 404(b)(1) Guidelines, a "permit cannot be issued if the proposed discharge will result in significant degradation of the aquatic ecosystem or if there is insufficient information to make a reasonable judgment as to whether the discharge will result in significant degradation. 40 C.F.R. §§230.12(a)(3)(ii), (iv)." *Utahns for Better Transportation v. USDOT*, 305 F.3d 1152, 1191 (10th Cir. 2002) (emphasis added). The failure to adequately consider (and expose to public scrutiny) the impacts associated with the proposed action is arbitrary and capricious under both NEPA and the CWA. *Id.* at 1192.

The inadequacies of the SDEIS demonstrate that Section 404(b)(1) Guidelines have not been complied with. To determine whether a proposed discharge will result in significant degradation, the 404(b)(1) Guidelines require detailed factual determinations regarding the effects of the discharge on the aquatic ecosystem. *Id.* at §230.10(c). *See also id.* § 230.11. Discharges that result in "significant degradation to waters of the United States" are also prohibited. 40 C.F.R. §230.10(c). Under the public interest review, a permit for NISP may not be issued if it is determined that doing so would be contrary to the public interest based on a "careful weighing" of the probable impacts of the project. 33 C.F.R. § 320.4(a). A "careful weighing" of environmental effects requires more information—including relevant quantitative analyses—than what is included in the SDEIS. Based on the current information in the SDEIS, the Section 404(b)(1) Guidelines and CWA's public interest review cannot be complied with.

3.2 FAILURE TO FULLY ADDRESS CUMULATIVE IMPACTS UNDER NEPA AND THE CWA

The SDEIS describes the cumulative impacts of NISP with the addition of Fort Collins' Halligan Water Supply Project ("Halligan Project") that includes the proposed enlargement of Halligan Reservoir, and the City of Greeley's proposed enlargement of Milton Seaman Reservoir. However, the SDEIS fails to disclose how the cumulative impacts will be evaluated with respect to each project. Of particular concern, as discussed below, is how responsibility for cumulative impacts from all three projects will be assessed to each project. As discussed above, such a deferral is not appropriate. *See Kern v. United States BLM*, 284 F.3d 1062, 1075 (9th Cir. 2002) (finding that it was not "appropriate to defer consideration of cumulative impacts to a future date when meaningful consideration can be given now").

Fort Collins is concerned that much of the assimilative capacity of the Poudre River to absorb certain impacts will be first apportioned to NISP because NISP is in an advanced stage of NEPA and CWA permitting relative to Fort Collins' and Greeley's respective projects. If true, Fort Collins is concerned that this approach would leave less assimilative capacity in the Poudre River for later analysis of the Halligan Project, which may lead to an exaggeration of streamflow impacts of the Halligan Project relative to an analysis in which the impacts of the Halligan Project are considered before the impacts of the NISP. This is especially concerning given that the streamflow impacts of the Halligan Project are expected to far less than NISP given the relative size difference between the two projects. For instance, the preferred alternative of the Halligan Project is the enlargement of Halligan Reservoir, which would be an increase of only 8,125 acre feet, which is significantly less than the volumes of all four NISP alternatives.

The SDEIS must provide information as to how the Corps intends to allocate assimilative capacity and all other cumulative streamflow impacts among the various Poudre River projects undergoing simultaneous NEPA and CWA permitting. Additional issues associated with cumulative impacts are discussed below.

3.3 UNCERTAINTY REGARDING MITIGATION MEASURES

It is Fort Collins' understanding that mitigation for NISP will be finalized with any Record of Decision ("ROD"), and that avoidance and minimization measures may be finalized before the ROD. As discussed further herein, Fort Collins notes that, at this point, the District's plans in these respects, which are summarized in Appendix F of the SDEIS, are conceptual and offer limited information on specific measures. Appendix indicates the intent of the District to recognize and react constructively to impairment of interests other than those of the District and the NISP participants, to be cooperative and responsive, and to participate in all reasonable efforts to address impairments to resources or interests caused by NISP. Where the document does not define specific limits or features of these commitments, however, it is of limited use except as a statement of general intent. *See Nat'l Audubon Soc'y v. Hoffman*, 132 F.3d 7, 17 (2d Cir. 1997) (holding an agency may rely on mitigation measures only when "the adequacy of proposed mitigation measures is supported by substantial evidence"); 40 C.F.R. § 230.75(d) (reliance on mitigation to be reasonable, the Corps' mitigation measures must "have been demonstrated to be effective in circumstances similar to those under consideration."). Clarification on these efforts is required by NEPA and the CWA.

As the entity most impacted by the Project, Fort Collins would welcome the opportunity to participate in mitigation-related discussion and efforts. After a complete assessment of the alternatives, Fort Collins urges that the proposed mitigation measures be demonstrated to be effective in minimizing the impacts of the proposed action.

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SECTION 4: PROPOSED MODIFIED ALTERNATIVE 4

4.1 THE CORPS SHOULD CONSIDER FORT COLLINS' PROPOSED MODIFIED ALTERNATIVE 4

Fort Collins investigated a modified Alternative 4 for NISP ("Modified Alternative 4") that would meet the NISP Participant's purpose and need while simultaneously maintaining relatively more water in the Poudre River through Fort Collins than all other action alternatives presented in the SDEIS. Such additional flows through Fort Collins would address many of the concerns addressed in these comments.

The Modified Alternative 4 is proposed to operate in such a way as to significantly reduce NISP diversions upstream of Fort Collins as compared to Alternative 2 (the District's preferred action), as well as Alternatives 3 and 4, resulting in relatively more stream flows and relatively fewer impacts to aquatic and riparian resources along a 23 mile reach of river through Fort Collins than the other action alternatives considered in the SDEIS. This Modified Alternative 4 is expected to entail costs comparable with other alternatives and would also result in fewer wetlands impacts than all other alternatives described in the SDEIS. Hence, Modified Alternative 4 is a practicable alternative with fewer environmentally damaging impacts than those alternatives considered in SDEIS, and consequently should be evaluated by the Corps in its NEPA and CWA Section 404 analysis. Under NEPA and the CWA, the Corps must take a hard look at this proposed alternative. 40 C.F.R. § 1502.14(a); *id.* at § 230.10(a). The Corps must consider and, if shown to be practicable, choose Modified Alterative 4 as the least damaging practicable alternative. *Id.*

4.1.1 Summary of Alternative 4 in the SDEIS

Alternative 4 features Cactus Hill Reservoir with multiple diversion points. Alternative 4 functions similarly to both Alternatives 2 and 3, except that rather than all diversions occurring at the Poudre Valley Canal headgate upstream of Fort Collins, a portion of diversions are made downstream of Fort Collins at the New Cache Canal headgate. Specifically, Alternative 4 calls for all New Cache direct flow exchange water associated with the South Platte Water Conservation Project ("SPWCP") to be diverted at the New Cache Canal rather than the Poudre Valley Canal as is common in Alternatives 2 and 3. This modification results in more flow maintained in a 23 mile stretch of river, including the reach passing through Fort Collins, than Alternatives 2 and 3. For example, Alternative 4 results in flow reductions in June at the Canyon Gage that are 17% less than Alternative 2 and 31% than Alternative 3. *See* Water Resources Technical Report, Section 8.1.

The SDEIS does not explain why Alternative 4 only considers diversions of New Cache direct flow exchange water to Cactus Hill Reservoir at the New Cache Canal headgate rather than multiple other water sources associated with NISP. SDEIS Section 2.2.7.5 indicates that the SPWCP exchanges using the New Cache Canal and Larimer and Weld Canal were evaluated for downstream diversions in various ratios, and that Alternative 4 was configured after "specialists in fisheries, stream morphology, and water quality … concluded the scenario reflected in Alternative 4 provided the most environmental benefit." The SDEIS does not indicate that either the Grey Mountain Water Right or the SPWCP reservoir exchanges associated with Terry Lake, Big Windsor Reservoir, and Timnath Reservoir were considered for downstream diversion.

Diversions for Alterative 4 under the SPWCP exchanges at the New Cache Canal only represent 20-30% of the total Poudre River diversions for the Project (depending on alternative and run). For example, in Run 5a, such diversions at the New Cache Canal represent some 12,000 acre feet of the 42,000 acre feet of diversions. *See* Run 5a final Post-Poudre Basin Network Processor, file 5aPPP_20121004_FINAL.xls.

4.1.2 Summary of Fort Collins' Proposed Modified Alternative 4

Alternative 4 could be formulated to deplete less flow in the Poudre River through Fort Collins if other sources of water for the Project were delivered to Cactus Hill Reservoir via the New Cache Canal or the Larimer and Weld Canal with pump stations to Cactus Hill Reservoir. The Modified Alternative 4 entails the following concepts as summarized below.

Modified Alternative 4 is proposed to include the same general structural components as Alternative 4 (*i.e.*, Cactus Hill Reservoir, Galeton Reservoir, distribution pipeline network, use of Big Windsor Reservoir as a forebay, etc.), with the following three primary exceptions: (1) expansion and lining of the Poudre Valley Canal would not be needed nor occur; (2) pump stations from the New Cache Canal and Big Windsor Reservoir to Cactus Hill Reservoir would be expanded, and (3) an advanced water treatment plant, as formulated for the No Action Alternative, may be needed.

Under Modified Alternative 4, the Poudre Valley Canal would still be used to fill Cactus Hill Reservoir, but would function similarly to that proposed in the No Action Alternative and would not require expansion or lining. As a result of not lining the Poudre Valley Canal, Modified Alternative 4 would result in 47 fewer acres of wetlands downslope of the Poudre Valley Canal that could suffer permanently altered hydrologic support and 92 fewer acres of other waters that would be permanently filled as compared to Alternative 4. *See* SDEIS Summary, Section S.7.6. As a result, the Modified Alternative 4 would result in fewer wetland effects (34 acres) as opposed to the Alternative 2 (the District's preferred action) (65 acres). *See* SDEIS Summary, Table S-8.

Under the Modified Alternative 4, diversions under the Grey Mountain Water Right to Cactus Hill Reservoir of up to 200 to 250 cfs would occur via the Poudre Valley Canal. This flow rate is proposed as it is the existing capacity of the Poudre Valley Canal and is equivalent to the rate of Poudre Valley Canal diversions proposed for the No Action Alternative. Above this amount, any Grey Mountain Water Right diversions to Cactus Hill Reservoir would be made at the New Cache Canal with the water thereafter pumped to Cactus Hill Reservoir.[2]

[2] Fort Collins acknowledges that this would require approval of a change of water right for the Grey Mountain Water Right by the District Court, Water Division 1. *See, e.g.*, C.R.S. 37-92-305(3)(a). However, Fort Collins notes that the point of diversion for the Grey Mountain Water Right would be moved, in part, downstream (not upstream), and that, based on Fort Collins' current understanding, the contemplated draft of the Grey Mountain Water Right would not be expected to change. *See Twin Lakes Reservoir & Canal Co. v. City of Aspen*, 568 P.2d 45, 193 Colo. 478 (Colo. 1977); *City of Thornton v. Clear Creek Water Users Alliance*, 859 P.2d 1348 (Colo. 1993). Such a change would thus not be anticipated to adversely affect the Grey Mountain Water Right. Provided that such a proposed change of water right

Based on Grey Mountain Water Right yields from Run 5a modeling and assuming a 200 cfs inflow capacity to Cactus Hill Reservoir from the Poudre Valley Canal, Modified Alternative 4 would result in approximately half of Grey Mountain Water Right yields being diverted each at the Poudre Valley Canal and the New Cache Canal. *See* Run 5a final Post-Poudre Basin Network Processor, file 5aPPP_20121004_FINAL.xls. Again using Run 5a modeling, it is estimated that overall, diversions to storage at the Poudre Valley Canal would be approximately 15-20% of the amount anticipated under Alternative 2. Additional modeling would be needed to determine specifics, but it is logical that the reduced Poudre Valley Canal diversions would thus translate to substantially more flow in the Poudre River downstream of the Poudre Valley Canal as compared to Alternative 2. This would substantially reduce the impacts to water quality, riparian health, wetlands and other impacts downstream of the Poudre Valley Canal relative to Alternative 2, as discussed in the 2008 Comments and these comments. It is assumed that diverting some water through the Poudre Valley Canal is needed to improve water quality in Cactus Hill Reservoir, and is reasonable considering that expanding and relining the Poudre Valley Canal would not be necessary for Modified Alternative 4. Additional study by the Corps would be needed on the amount and timing of Poudre Valley Canal diversions under the modified alternative as these diversions would have the benefit of improving water quality in Cactus Hill Reservoir, but the detriment of depleting Poudre River stream flow.

The Modified Alternative 4 further proposes that a majority of Poudre River diversions associated with the SPWCP would be made at the New Cache Canal headgate rather than at the Poudre Valley Canal. The Modified Alternative 4 proposes that all New Cache direct flow exchange water and all exchange water associated with Terry Lake and Timnath Reservoir be diverted at the New Cache headgate for delivery to Cactus Hill Reservoir. In order to reduce pumping and improve water quality in Cactus Hill Reservoir, it is likely desirable to make some diversions under the SPWCP exchanges at the Larimer and Weld Canal headgate for delivery to Big Windsor Reservoir with subsequent pumping to Cactus Hill Reservoir. Therefore, under Modified Alternative 4, it is conceptually assumed that 50% of the Larimer and Weld direct flow exchange water and 50% of Big Windsor Reservoir exchanges under the SPWCP would be diverted at the New Cache Canal headgate. Additional study by the Corps would be needed to determine the exact ratio of Larimer and Weld diversions at each diversion location under the modified alternative weighing improvements to water quality in Cactus Hill Reservoir with the detriments of depleting a longer reach of the Poudre River.

By diverting SPWCP exchange water further downstream at the New Cache Canal, additional flow will be maintained in the Poudre River between the originally proposed diversion point and the New Cache Canal. In the case of Larimer and Weld direct flow exchange water and SPWCP reservoir exchanges associated with Terry Lake, Big Windsor Reservoir, and Timnath Reservoir, by diverting this water further downstream flows would be improved between the current diversion locations and New Cache headgate above baseline conditions. As such, Modified

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were shown to not adversely affect Fort Collins' water rights, Fort Collins would likely not oppose such a change of the Grey Mountain Water Right.

Alternative 4 could even improve flows in places and times through Fort Collins above what is observed in the current baseline without any mitigation or augmentation flows.

The diversions to Cactus Hill Reservoir detailed above would result in far fewer flow impacts along a 23 mile reach of the Poudre River than any other action alternative examined in the SDEIS. Consequently, the Modified Alternative 4 may not require a flow augmentation program similar to that proposed by the District for Alternative 2.

4.1.3 Other Considerations for Modified Alternative 4

Under the Modified Alternative 4, water quality in Cactus Hill Reservoir is preliminarily predicted to be comparable to the water quality predicted in Cactus Hill Reservoir for the No Action Alternative, but worse than predicted for either Glade Reservoir for Alternative 2 or Cactus Hill Reservoir for Alternatives 3 and 4, especially in terms of total dissolved solids ("TDS"). Using water quality data from the SDEIS (SDEIS Tables 4-32, 4-37, and 4-39) and predicted relative flow contributions by diversion location, the TDS conceptually predicted for Cactus Hill Reservoir in the Modified Alternative 4 is 350-400 mg/L, which is below the 500 mg/L maximum containment limit and the 400 mg/L upper limit goal used for developing the No Action Alternative in the SDEIS. *See* page 4 of Technical Appendix: NISP No Action Alternative Evaluation. However, with such high TDS it is assumed (similarly to the No Action Alternative) that NISP Participants would construct advanced water treatment facilities.

Diversions at the New Cache Canal headgate are downstream of wastewater treatment plant discharges, which raise certain water quality concerns both for users of Cactus Hill Reservoir and wastewater effluent dischargers. It is likely that the Modified Alternative 4 would lead to a Total Maximum Daily Load process and limitations for nutrients associated with wastewater discharges, such as those made by Fort Collins, above diversions to Cactus Hill Reservoir at the New Cache Canal.

Under the Modified Alternative 4, annual pumping inputs would be greater than any other alternative in the SDEIS due to the relatively larger pumping head required to fill Cactus Hill Reservoir from the New Cache Canal. However, pumping costs are not so large as to preclude the viability of Modified Alternative 4. For example, and as a worst case scenario, it is conceptually estimated that if all inflows to Cactus Hill Reservoir were taken at the New Cache Canal the total energy requirement would be roughly 80,000,000 to 85,000,000 KW-hr. This amount may be compared to 64,400,000 KW-hr for Alternative 4 and 48,100,000 KW-hr for Alternative 2 under the Reclamation Action Option or 61,300,000 for Alternative 2 under the No Reclamation Action Option. *See* SDEIS Summary, Table S-10. Diverting all inflows to Cactus Hill Reservoir at the New Cache Canal exceeds that which is proposed for Modified Alternative 4, but was analyzed as a worst case scenario for illustrative purposes. Under this worst case scenario, total annual pumping power costs for Modified Alternative 4 are expected to be, at a maximum, roughly $6,000,000, as opposed to $4,511,000 for Alternative 4, $4,291,000 for Alternative 2 without Reclamation Action, and $2,663,000 for Alternative 2 with Reclamation Action (from SDEIS Table 2-12). Worst case energy and cost estimates for Modified Alternative 4 were developed with available information summarized SDEIS data and are conceptual in nature. Given that Modified Alternative 4 would

likely have significantly less environmental impact than the SDEIS alternatives, including fewer wetlands and streamflow impacts along a vital 23 mile reach of Poudre River, it remains a practicable alternative, even in light of the approximated higher pumping costs. Further, the difference in pumping costs between Modified Alternative 4 and the other alternatives is small relative to the overall costs of the proposed action.

Because of the increased pumping inputs required for Modified Alternative 4, greenhouse gas emissions associated with pumping are anticipated to be greater than any other SDEIS alternative, which may exacerbate NISP's climate change impacts, which are discussed in Section 8 of these comments. Nevertheless, given that the proposed Modified Alternative 4 will have far fewer aquatic impacts than other SDEIS alternatives, including fewer impacted wetlands and fewer streamflow impacts along a vital 23 mile reach of Poudre River, the increased greenhouse gas emissions associated with larger pumping inputs may be justified, especially given that increased greenhouse gas emissions could be avoided, minimized, or mitigated, for example, by the use of renewable energy sources or by employing other climate change mitigation methods.

Total capital costs for Modified Alternative 4 are expected to be comparable to Alternative 4 costs provided in the SDEIS. Although additional costs are required for upgrading the New Cache Canal pumping facilities and potentially for advanced water treatment, large cost savings are realized from not having to expand and line a 30 mile section of the Poudre Valley Canal. Using costs provided in the SDEIS (SDEIS Table 2-12), it is conceptually predicted that the Modified Alternative 4 would have a capital cost of roughly $700,000,000. This amount is 38% more than the Alternative 2 with Reclamation Action, but only 6% more than Alternative 2 without Reclamation Action. Furthermore, mitigation costs will likely be less for Modified Alternative 4 than other alternatives given that the environment impacts will be less. Cost estimates for the Modified Alternative 4 were developed with summarized SDEIS data and are conceptual in nature. Accordingly, Fort Collins urges the Corps to satisfy its legal obligation under NEPA and to take a hard look at Modified Alternative 4.

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SECTION 5: WATER QUALITY COMMENTS

The SDEIS describes three major water quality impacts of interest to Fort Collins, as discussed in detail below: (1) degradation of raw source water quality delivered to the Fort Collins Water Treatment Facility ("FCWTF"); (2) degraded water quality or flow regime changes on Poudre River Segments 10a, 10b, and 11; and (3) degraded water quality or flow regime changes on the wastewater discharge permits issued for Fort Collins' two water reclamation facilities ("Drake WRF" and "Mulberry WRF").

The SDEIS was also issued without several quantitative analyses that are necessary for the Corps to take a hard look at water quality impacts required NEPA and the CWA. Without this information, the Corps cannot make a "fully informed and well-considered decision." *Vermont Yankee*, 435 U.S. at 558. Also, the lack of analyses prevents Fort Collins from meaningfully understanding the possible effects on its interests. To comply with NEPA, the Corps must analyze the antidegradation regulations for the Drake and Mulberry WRFs and conduct temperature modeling and water quality modeling for the Poudre River.

The FCWTF currently receives water from two sources: Horsetooth Reservoir (by direct connection) and Poudre River water routed through the Fort Collins Pipeline and Pleasant Valley Pipeline ("PVP"). The PVP is a pipeline (separate from the Fort Collins Pipeline) that runs from the Munroe Canal to the FCWTF. Fort Collins also shares use of the PVP with other entities, including the Fort Collins-Loveland Water District, which uses the PVP to deliver water to the Soldier Canyon Treatment Plant. Under Alternative 2 with the Reclamation Action Option, both of Fort Collins' raw water sources would be affected adversely. Residence times in Horsetooth Reservoir would be substantially increased resulting in poorer water quality in Horsetooth Reservoir. As discussed below, Glade Reservoir water may be of lower quality than Poudre River water due to long hydraulic residence times in that reservoir, and would be delivered through the PVP to the Soldier Canyon Treatment Plant, adversely affecting Fort Collins' Poudre River water run through the PVP. It is reasonably foreseeable that both changes would require Fort Collins to perform increased water treatment that will be costly for Fort Collins to install and operate.

Alternative 2 will affect the Poudre River by diversions into Glade Reservoir decreasing flushing flows and Glade Reservoir releases back to the river during the warm months that will impact water quality. Flushing flows remove algal biomass and excess sediment from the river bottom. Reduction of these high flows could lead to development of large algal mats and island formation.

Glade Reservoir water has the potential to be higher in certain water quality constituents (TOC, iron, manganese, nitrogen, phosphorus) than water currently released from Horsetooth Reservoir to the Poudre River. It is reasonably foreseeable that increases in regulated constituents in the river upstream of Fort Collins' permitted discharge points would lead to exceedances of standards in the river and exceedances of effluent limits in the mixed flow downstream of the discharge point. For the downstream mixed flow, reductions in river flow combined with upstream increases in regulated constituents will make exceedances of standards more likely.

5.1 COMMENTS REGARDING INCOMPLETE ANALYSES RELATED TO WATER QUALITY

5.1.1 No Analysis of Antidegradation Regulations and Mulberry and Drake WRFs

SDEIS Section 4.3.10 401, Certification Process and Antidegradation Review

> Statement: "*The WQCC is responsible for issuing Water Quality Certifications under Section 401 of the CWA for projects or actions that are applicable to the provisions of the Colorado 401 Certification Regulation (WQCC Regulation #82: 5 CCR 1002-82). […] The 401 certification process is a permitting requirement separate from NEPA compliance. 401 certification and antidegradation review will be required for any permitted alternative prior to construction. To facilitate the 401 permitting process, additional water quality modeling will be conducted for the FEIS in coordination with the WQCD and the EPA using WQCD protocols. The intent of this effort is to use the results of the water quality analysis conducted for 401 certification in the FEIS and thus, minimize any duplication of effort.*"

Comment: The SDEIS does not address the effects of NISP on Mulberry and Drake WRF facilities' compliance with antidegradation regulations, which are based on maintenance of historical water quality and not solely on water quality standards. Fort Collins thus cannot meaningfully analyze NISP's effects in this respect.

NEPA and the CWA require that the Corps address indirect effects of the proposed action. *See* 40 C.F.R. § 1508.8(b). *See also id*. § 230.11(h) (requiring consideration of "secondary effects"). Further, the Corps' guidelines prohibit a discharge that causes or contributes to violations of any state water quality standards. *See* 40 C.F.R. § 230.10(b)(1). Thus, the Corps must conduct additional studies and analyses in these proceedings with respect to the compliance of Mulberry and Drake WRF facilities with antidegradation regulations.

5.1.2 No Analysis of Chlorophyll

SDEIS Section 4.4.3.1.1, Poudre River, Flows and Flooding

> Statement: "*Laporte Reach. Flood flows are predicted to be reduced. […]Fort Collins and Upper Timnath Reaches. There is a predicted 20% to 35% reduction in flow duration at or above 1,000 cfs, as well as a 20% to 40% reduction in the duration of flows in the interval from 140 cfs to 1,000 cfs. […] For the 26-year period of record, 23 flushing events under Current Conditions lasting for 325 days in total would become 16 flushing events under Alternative 2 lasting for 222 days in total.*"

Comment: Amounts of attached algae in streams (measured as chlorophyll) are currently regulated by the State of Colorado under Section 31.17 of Regulation 31 of the Water Quality Control Commission, 5 CCR 1002-31, under interim values, and the use of these interim values will be used in the adoption of water quality standards prior to May 31, 2022. Flow velocity exercises strong control over chlorophyll accumulation in stream channels. The SDEIS does not assess the impact of reduction of flow volumes and flow velocities on chlorophyll development. Fort Collins thus cannot judge and meaningfully analyze the effects on Fort Collins.

The Corps must analyze all NISP alternatives' impact on chlorophyll accumulation. This is essential both for NEPA and the CWA prohibition on fills that would cause or exacerbate any violation of water quality standards.

5.1.3 No Quantitative Analysis of Temperature

SDEIS Section S.1.2.2, Planned Activities After SDEIS Issuance

Statement: "*Before FEIS issuance, or issuance of a Record of Decision as noted, the Corps anticipates completing the following activities: […] Complete Phase II water quality and stream temperature modeling in coordination with the WQCD and the EPA using WQCD protocols.*"

Comment: The SDEIS states that temperatures within the Poudre River will be higher as a result of the operation of NISP, but does not offer quantitative projections that would allow Fort Collins to meaningfully analyze the likelihood that specific stream sections now in compliance with State standards for temperature for protection of aquatic life will become noncompliant as a result of the project.

As discussed above, an "accurate scientific analysis . . . and public scrutiny are essential to implementing NEPA." 40 C.F.R. § 1500.1. The Corps' deferring analyses violates NEPA's requirement that agencies "will have available, and will carefully consider, detailed information concerning significant environmental impacts, and that the relevant information will be made available to the larger [public] audience." *N. Idaho Cmty. Action Network*, 545 F.3d at 1153. Without temperature data, Fort Collins and other stakeholders cannot meaningfully review temperature impacts. Thus, the Corps must supplement or revise the SDEIS to include a quantitative analysis of temperature for all alternatives, and the Corps must afford Fort Collins and others an opportunity to review and comment on that information. Because this is a critical water quality attribute, appropriate analysis is necessary to comply with the CWA. *See* 40 C.F.R. § 230.10(b).

5.1.4 No Quantitative Analysis of Water Quality Effects Below Glade Reservoir

SDEIS Section S.7.2, Surface Water Quality

Statement: Table S-6. Potential for exceedance of water quality standards.

Parameter	Alternative 2	Alternative 3	Alternative 4
Poudre River above Lincoln Street in Fort Collins (Segment 10)			
Copper	Medium	Medium	Medium
Dissolved Manganese	Medium	Medium	Medium
Poudre River from Lincoln Street to below Boxelder Creek (Segment 11)			
Total Phosphorus	Medium	Medium	Medium
Selenium	High*	High	High
Poudre River from below Boxelder Creek the South Platte River (Segment 12)			
Total Recoverable Iron	High*	High*	High*
Ammonia	High*	High*	High*
Total Phosphorus	High*	High*	High*
Selenium	High*	High*	High*
Segment 1b of the South Platte River			
Total Recoverable Iron	High*	High*	High*
Dissolved Manganese	Medium	Medium	Medium
Ammonia	Medium	Medium	Medium
Total Phosphorus	High*	High*	High*
Sulfate	High*	High*	High*

*Water Quality Standard already being exceeded under current conditions.

SDEIS Appendix F, Section 4.4.1, Glade Reservoir Water Quality Enlargement (FW-06)

Statement: "*Northern Water proposes to evaluate an increase in Glade storage to as much as 192,500 acre-feet to allow for operational flexibility during the late summer period. This would include the following tasks to be completed between the SDEIS and FEIS, so that the Corps permit decision can include a potential water quality enlargement of Glade Reservoir:*

- *Verification through the use of full CTP hydrology and modeling that an increase in storage can off-set the lack of diversion during late summer while still meeting full project yield.*
- *Integration of the detailed water quality modeling with the refined configuration and determination of potential operational strategies for mitigation of effects or environmental enhancement, including the evaluation of temperature thresholds above which NISP diversions may be curtailed.*
- *Validation by the third party contractor that no significant adverse environmental consequences are caused by either the enlargement of Glade or the change in inflow pattern.*"

Comment: The SDEIS forecasts adverse water quality effects of NISP on the Poudre River below the point of diversion for Glade Reservoir but omits quantitative predictions, which are stated to be given only in the FEIS. Therefore, Fort Collins and other affected parties cannot judge or meaningfully analyze whether impairments will lead to new violations of water quality standards as reflected in 303(d) listing of impaired waters by the State of Colorado. Details regarding the proposal to enlarge the capacity of Glade Reservoir to accommodate water quality needs are not given. The changes in stream flows and associated resource impacts from enlarging Glade Reservoir must be fully described and analyzed.

As stated above, NEPA requires that the Corps conduct a quantitative analysis of water quality impacts below Glade Reservoir and provide that information in the SDEIS to Fort Collins and other stakeholders. *See* 40 C.F.R. §§ 1502.22, 1502.9. This analysis is also essential for compliance with the Corps' obligation to avoid causing or exacerbating violations of water quality standards. *See* 40 C.F.R. § 230.10(b).

5.1.5 Water Quality Monitoring Is Not Mitigation

SDEIS Appendix F, Section 4.4.3.2, Water Quality Monitoring

Statement: "*Additional water quality monitoring would be performed to more fully characterize and understand the effects of NISP operations on Poudre River water quality before and after NISP project components are built and implemented, and to meet the water quality commitments of this Conceptual Mitigation Plan. […] Initial data collection […]Long-term monitoring […] The final sites, parameter list, and frequency for the initial data collection effort will be determined between the SDEIS and FEIS based on the analyses and modeling being conducted for the FEIS and State 401 water quality certification process.*"

Comment: The only specific action item in the mitigation plan addressing water quality impacts is a water quality monitoring program. Monitoring, without potential actions based on the monitoring, does not compensate for or mitigate unavoidable impacts. The conceptual mitigation plan fails, at this point, to address important water quality issues in Segment 11, where dilution water quantity and quality are critical to compliance with water quality standards and antidegradation rules. Water quality maintenance in this reach requires commitments to minimum flows sufficient to insure adequate dilution of wastewater effluent. Low flow augmentation commitments are based on availability of water at the point of augmentation and not through the downstream reaches. This

problem needs to be addressed explicitly with reference to the two wastewater treatment plants for the City (Mulberry and Drake WRFs).

As stated above, the SDEIS water quality assessment lacks key quantitative analyses. Under NEPA and the CWA, proposed mitigation measures dependent on incomplete environmental impact analyses fail. *Ohio Valley Envtl. Coalition v. United States Army Corps of Eng'rs*, 479 F. Supp. 2d 607, 627 (S.D. W. Va. 2007). Stated another way, the Corps' purported mitigation in the form of monitoring is inherently inadequate because it is based on only a portion of the required water quality analyses. Any mitigation for NISP must directly address the impacts discussed herein.

5.2 COMMENTS REGARDING IMPACTS TO SOURCE WATER QUALITY FOR THE FCWTF

5.2.1 Changes to Hydraulic Residence Time in Horsetooth Reservoir

SDEIS, Sections 2, 3, and 4

Statement: Page 2-41: *"Horsetooth Reservoir releases an average of nearly 60,000 AF to the Poudre River each year."*

Statement: Page 3-27: *"C-BT deliveries to the Poudre River from Horsetooth Reservoir via the Hansen Supply Canal averaged nearly 75,700 AFY for the period including WY 1952-2009 (CDM Smith, DiNatale, and Hydros 2011)."*

Statement: Page 4-41: *"In addition to these releases to the Poudre River and the Poudre Valley Canal, Glade Reservoir under the Reclamation Action Option would release an average of 10,500 AFY for direct delivery to the water treatment facilities for Participants FCLWD, Evans, Eaton, Severance, and Windsor (see the 2014 Operations Report, Section 5.1.1.1). Potential pumping from Glade Reservoir to Horsetooth Reservoir (see Section 4.2.3.3.3) would average about 400 AFY (averaged over 56 years)."*

Statement: Page 4-46: *"Horsetooth Reservoir releases averaged 51,300 AFY, with 49,500 AFY released to the Poudre River and 1,800 AFY delivered to the Poudre Valley Canal via the Windsor Extension. Under NISP Alternative 2 with the Reclamation Action Option, Horsetooth Reservoir releases would be reduced to 21,900 AFY (20,200 AFY to the river and 1,700 AFY via the Windsor Extension)."*

Comment: The planned decreases in the release of water from Horsetooth Reservoir (from 51,300 to 21,900 acre feet per year) will lead to a substantial increase in hydraulic residence time for water in Horsetooth Reservoir. Under operational scenarios proposed in this SDEIS, the historical average residence time of 2-3 years could become about 7 years. Increased residence time for reservoirs in Colorado often is associated with increased algal biomass and change in algal community composition in the upper mixed layer of the reservoir during water column stratification season. *See* Northern Water, 2014 Water Quality Stakeholders Meeting: 2013 Three Lakes Water Quality and Operations, or Why Did Shadow Mountain Turn Green, dated March 4, 2014. An increase in algal production and changes in community composition in Horsetooth Reservoir could potentially result in increases in TOC concentrations, more frequent occurrence of elevated concentrations of taste and odor compounds such as geosmin and 2-methylisoborneol (MIB), as well as an increased likelihood of cyanotoxin production. Each of these issues poses significant concern for the FCWTF and would

potentially require new and/or costly monitoring and treatment solutions that are currently not required, including the use of powdered or granular activated carbon.

As described in Fort Collins' comment regarding SDEIS Section 4.3.4.5 Effects on Water Treatment Plant Operations, the proposed increase in hydraulic residence time in Horsetooth Reservoir was not included in the modeled scenarios for the SDEIS. As such, it is not possible to evaluate the combined effects of increased hydraulic residence time and possible inflows from Glade Reservoir on algal abundance or TOC concentrations, or to estimate the likelihood of algal metabolites production like geosmin, MIB or cyanotoxins. Without this information, the FCWTF remains vulnerable to unexpected and substantial costs associated with new or enhanced treatment costs.

The City has identified ozone/advanced oxidation as the water treatment solution needed to manage regular occurrence of cyanotoxins and/or taste and odor compounds like geosmin and MIB in the Horsetooth raw water supply. *See* CH2M. 2015. Technical Memorandum: Revised Costs for Impacts to Water Treatment Operations Resulting from NISP Operations. August 6, 2015 ("Costs Report"), which is provided with these comments. Capital costs associated with this type of advanced treatment are estimated at $26.9 million, in 2015 dollars, with an annual operating cost of $703,000. Likewise, the ozone/advanced oxidation is the treatment solution proposed for managing persistent taste and odors issues, with the same capital and annual operating costs.

Additionally, the use of granulated activated carbon may be required in the event that concentrations of TOC in Horsetooth Reservoir increase to 5-6 mg/L on a consistent basis and enhanced coagulation fail to reduce TOC to needed levels. The capital costs associated with a new organics removal facility are $72.9 million and annual costs of $2.5 million, in 2015 dollars. *See* Costs Report. Although the application of granular activated carbon is not considered necessary under the scenario of a 0.5 mg/L increase in average TOC concentrations, as reported in the SDEIS, such measures may become necessary in the event that the proposed changes in hydraulic residence time result in TOC concentrations consistently above 5-6 mg/L. As stated previously, the information presented in the SDEIS is not adequate for addressing this likelihood.

Longer hydraulic residence time also can lead to greater extremes of hypolimnetic oxygen loss, which facilitates the release of dissolved iron and manganese from bottom sediments (Dortch 1997). Dissolved iron and manganese precipitate when oxygenated upon release from the hypolimnion. The precipitate forms particles and coatings that interfere with water treatment. Taste and odor problems may also be caused by anoxic water even after aeration. These issues related to prolonged hypolimnetic oxygen depletion would likely result in additional treatment costs from increased chemical usage specifically, pre-oxidation with chlorine dioxide to manage manganese and iron issues at an estimated peak daily cost of $2,109, or a weekly cost of $14,765, and/or the use of powdered activated carbon (PAC) to remove taste and odor compounds. *See* Costs Report.

If, due to NISP, TOC concentrations in Horsetooth Reservoir reach a level that the FCWTF cannot treat without installing additional treatment facilities, Northern must be required to pay for installation and operation of a pretreatment facility to remove some TOC from raw source water before it enters the FCWTF. If taste and odor compounds or cyanotoxin concentrations reach a

problematic level, Northern must deliver treatable water to the FCWTF that can be used until the water quality in Horsetooth Reservoir reaches a treatable status. In addition, if Horsetooth water quality is degraded to the point that it is not usable for more than 6 months, Northern must be required tp pay for constant forced destratification. Mixing could reduce the amount of greenhouse gasses that would normally be released from the reservoir during stratification.

The CWA requires the Corps to take hard look at the potential negative changes in the water quality of Horsetooth Reservoir caused by the proposed action. Specifically, the Section 404(b)(1) Guidelines prohibit any discharge that would cause or contribute to "significant degradation of the waters" or "violations of any applicable State water quality standard . . . ." 40 C.F.R.§ 230.10(b)(1), (c). These impacts include "secondary effects" caused by the project including the impacts discussed above. 40 C.F.R. § 230.10(h). Additionally, NEPA requires the Corps to address "reasonably foreseeable" impacts and emphasizes the importance of taking a hard look at uncertain effects:

> [I]n the ordinary course of business, people do make judgments based upon reasonably foreseeable occurrences. . . . The agency has the responsibility to make an informed judgment, and to estimate future impacts on that basis, especially if trends are ascertainable . . . . The agency cannot ignore these uncertain but probable, effects of its decisions.

46 Fed. Reg. at 18031. Given the potentially significant impacts on water quality in Horsetooth Reservoir, and the potential costs that would be incurred by Fort Collins to address those impacts, the Corps must assess the potential impacts and mitigation measures discussed above.

5.2.2 Hydraulic Residence Time in Glade Reservoir and the PVP

SDEIS Section 2.5.4.1, Glade Reservoir

Statement: "*The modeled hydraulic residence time (the length of time diverted water would remain in the reservoir) would be 4.6 years.*"

Comment: Under operating conditions described in the SDEIS, Glade Reservoir will experience long hydraulic residence times. The water quality effects of long residence times in Glade Reservoir are expected to be similar to those described above for Horsetooth Reservoir. As such, Glade Reservoir water has the potential to be higher in certain water quality constituents (TOC, iron, manganese, nitrogen, phosphorus) than water currently released from Horsetooth Reservoir to the Poudre River. Increases in regulated constituents in the river upstream of Fort Collins' permitted discharge points could lead to exceedances of standards in the river and exceedances of effluent limits in the mixed flow downstream of the discharge point. For the downstream mixed flow, reductions in river flow combined with upstream increases in regulated constituents will make exceedances of standards more likely. Furthermore, Glade Reservoir water delivered through the PVP to the Soldier Canyon Treatment Plant may adversely affect Fort Collins' Poudre River water running through the PVP.

Water storage in Glade Reservoir will lead to differential water quality conditions in the upper and lower portions of the water column during the season of water column stratification. A multiple outlet structure will be available for Glade Reservoir so that selective water withdrawal is possible. This measure may not be sufficient, however, to protect the quality of waters released from the reservoir because of the simultaneous occurrence of impairment of the upper water column (high temperature, algae) and lower water column (iron, manganese, organics) during the season of stratification. Release of water from points below the epilimnion of Glade Reservoir during the summer for purposes of maintaining low temperature or avoiding algal biomass in the epilimnion are complicated by the likely presence of substantial concentrations in the release water of dissolved iron and manganese that will precipitate as oxides and hydroxides upon entering the river. (Dortch 1997, Smith 1982). It can be assumed that the engineered release structure will reoxygenate the water, but the problem of chemical precipitation is not dealt with in the mitigation plan.

The mitigation for Alternative 2 must include commitment to and measures ensuring constant destratification of Glade Reservoir in the event that water quality problems resulting from stratification are observed or expected. Mixing could reduce the amount of greenhouse gasses that would normally be released from the reservoir during stratification.

5.2.3 Glade Reservoir Forebay Water Quality Issues

SDEIS Section 2.5.4.1, Glade Reservoir

Statement: "*A forebay and pump station would also be constructed southwest of the reservoir.*"

Comment: The SDEIS describes the building of a forebay in front of the dam, but not the operation of the forebay. Under certain operational scenarios, it is reasonably foreseeable that water could be released directly from the forebay into the PVP and/or the Poudre River. The forebay is a small waterbody that is hydrologically separated from Glade Reservoir. The quality of the water in the forebay will vary greatly based on factors such as hydraulic residence time, degree of drawdown, and quality of source water. Waters of the forebay may be subject to warming, wind generated turbidity, or algal blooms to a degree that would not be expected in Glade Reservoir. As a result, downstream uses could be impaired if water is released directly to the river from the forebay.

If the Corps approves NISP, the Corps must include permit conditions prohibiting any release of forebay water directly into the PVP or the Poudre River under any conditions. If the Corps does not prohibit releases, then it must adequately assess the potential impact releases of the forebay water.

5.2.4 Glade Reservoir Water Quality During the Initial Fill

SDEIS Section 4.3.4.1.1, Projected Reservoir Water Quality, Glade Reservoir

Statement: "*Water quality during initial reservoir filling would be affected by the release of nutrients and organic matter in the soil. During this period water quality may be impaired by high suspended solids, elevated nutrient concentrations, and potentially high concentrations of algae (Lewis 2003).*"

Comment: The SDEIS recognizes that Glade Reservoir, when in the filling phase, may show water quality problems that are associated with early stabilization of the reservoir. The SDEIS commits to withholding water in the reservoir from use for a specific period of time to allow for stabilization of reservoir water quality.

If the Corps approves NISP, it must require as a permit condition that the District commit to measures for extending the withholding period as necessary to prevent impairment of downstream waters to a degree that would not be expected over the long term, i.e., the startup period during which waters are withheld must not be defined by elapsed time, but rather by water quality conditions in the reservoir.

5.2.5 Use of the PVP to Deliver Water From Glade Reservoir

SDEIS Appendix F, Section 3.2.1, Avoid Munroe Canal Diversions (FW-01)

Statement: "*The original Draft EIS considered using the Munroe Canal for two operations associated with NISP. […] The exchange has been eliminated in the SDEIS analysis, and replaced with a new pipeline directly from Glade Reservoir to the Pleasant Valley Pipeline (for Fort Collins-Loveland Water District) and a new pipeline directly from Glade Reservoir to the Soldier Canyon Filter Plant (for Eaton, Severance and Windsor).*"

Comment: The proposed use of the PVP to convey deliveries of water from Glade Reservoir creates potential water quality issues, as described above.

Due to potential degradation of water quality caused by Alternative 2, these releases must be required to be made through a second pipeline rather than through the PVP, so that all water moved through the PVP originates from the Poudre River upstream of the Glade Reservoir release point. This would allow FCWTF to receive raw water supply of appropriate quality for treatment when Horsetooth Reservoir and Glade Reservoir are not a suitable source for drinking water supply. The Corps must also consider the alternative of constructing a pre-treatment facility for releases from Glade Reservoir into the PVP to maintain the existing water quality parameters.

5.2.6 Analysis of TOC Levels in Horsetooth Reservoir

SDEIS Section 4.3.4.5, Effects on Water Treatment Plant Operations, Pages 4-117 and 4-118

Statement: "*The Horsetooth Reservoir water quality model (Hydros 2013) was used to evaluate changes in TOC concentrations for the Reclamation Action Option (ERO and Tetra Tech 2015). The model was used to estimate changes in TOC concentrations in the Soldier Canyon outflow, which would be the raw water supply to the Fort Collins and Tri-Districts WTPs.*"

"*The model results for the Reclamation Action Option with and without a pipeline from Glade Reservoir to Horsetooth Reservoir are provided in Table 4-35.*

"*Table 4-35 shows that for the Soldier Canyon Outflow, which supplies Horsetooth Reservoir water to the Fort Collins and Tri Districts WTPs, average TOC concentrations are predicted to be higher under the Reclamation Action Option for the maximum pipeline volume. However, even for the highest average predicted TOC*

concentration of 3.52 mg/L in the Soldier Canyon outflow, this would be only 3.5% higher than the baseline average TOC concentration of 3.40 mg/L."

Hydros Consulting, dated June 4, 2013, "Transmittal of Horsetooth Reservoir Model Simulation Results for NISP

Statement: "*The Horsetooth Reservoir model is a dynamic, two-dimensional hydrodynamic and water-quality model developed in the CE-QUAL-W2 (version 3.6) modeling framework. […] The model was calibrated and validated for the period January 2005 through September 2010.*

"*To allow for simulation of NISP scenarios which include pipeline inflow into Satanka Bay (located at the north end of the reservoir), the original Horsetooth model was modified slightly. Specifically, detail was added to the bathymetric representation of Satanka Bay to create a distinct model branch at this location to allow for inflows. []Bathymetric modifications were purposefully conducted to maintain the area-elevation-volume relationships of the original model. Simulation of observed conditions for the January 2005 through September 2010 period was performed with the modified model and compared to the same-period simulation from the original model. Differences in the water quality and hydrodynamics between the two runs were negligible.*

"*The simulation of observed conditions with the modified model (described above) for the full calibration and validation period (January 2005 through September 2010) served as the 'baseline' run against which all NISP scenario runs are compared in the results files provided to ERO Resources. All NISP scenarios for the Horsetooth Model runs were developed to simulate the same January 2005 through September 2010 time-period with varying inflows, outflows, and Satanka Bay pipeline water-quality assumptions. As such, for all runs, the same meteorology and Hansen Feeder Canal inflow concentrations were applied.*"

Comment: The conceptual approach described within the SDEIS regarding the quantification of the impact on TOC concentrations in Horsetooth Reservoir resulting from the transfer of water from Glade Reservoir is generally sound. However, a review of the modeling and resulting analysis suggest that the presented data and analysis are flawed and misleading, and inappropriately minimize the impact of Glade Reservoir water on expected TOC concentrations in Horsetooth Reservoir, which is a critical source of treated water for Fort Collins.

Per the documentation provided for the SDEIS and referenced as "Hydros, 2013" and "ERO and Tetra Tech 2015," a baseline CE-QUAL-W2 model ("baseline model") of Horsetooth Reservoir was developed and used to determine water quality impacts associated with the possible introduction of water from Glade Reservoir into Horsetooth Reservoir. The documentation of the model (from Hydros, 2013) suggests that the baseline model at times accurately reproduces measured TOC concentrations observed near the surface and reservoir bottom adjacent to the Solider Canyon Dam outlet. There are other times, however, where the baseline model continuously under predicted TOC concentrations at certain locations. Specifically, the baseline model under predicted observations made during the summers of 2005, 2006, and 2007 near the reservoir surface adjacent to Solider Canyon Dam. In 2005, the difference between modeled and observed TOC values appears to exceed 1 mg/L (or nearly 33% of the modeled value). Improved agreement is obtained near the bottom of Solider Canyon Dam (when compared to agreement at the surface). However, the baseline model also under predicts (by 0.5 mg/L or 16% of modeled value) TOC concentrations during the summer of 2005 and 2006. The amount of these under predictions is significant in terms of concentrations and percentages of modeled values.

The magnitude of the under predictions of TOC concentrations in Horsetooth Reservoir range from 0.5 mg/L to 1.0 mg/L. By comparison, the modeled average TOC concentration increase from the introduction of Glade Reservoir water into Horsetooth Reservoir is 3.5% or 0.12 mg/L. Because the modeled average TOC concentration increase is much smaller than the under prediction errors in modeled TOC concentrations, the modeled average TOC concentration increase is not believable or reliable.

In addition, average TOC concentrations should not be utilized to assess the impact of introducing Glade Reservoir water into Horsetooth Reservoir, as doing so masks any large increase event(s) that may occur in the specific water that is introduced into the City's system because such large increase event(s) are not identified in the average value. These large increase events are not evident in the results provided within the SDEIS, and would dictate any alternations needed to water treatment systems before Horsetooth Reservoir water that has been mixed with Glade Reservoir water could be utilized by Fort Collins.

Aside from concerns regarding the accuracy of the baseline model discussed above, Fort Collins has concerns regarding the modified model used to simulate Glade Reservoir inflows into Horsetooth Reservoir. For this discussion, this modified model is referred to as the "proposed-conditions model."

Per the documentation referenced above, the proposed-conditions model is similar to the baseline model discussed above except that it includes model cells representing Satanka Bay, and incorporates inflows from Glade Reservoir into Satanka Bay. Per the proposed-conditions model documentation, the impact of introducing Glade Reservoir water into Horsetooth Reservoir via Satanka Bay was determined by comparing computed Soldier Canyon outflow TOC concentrations from the proposed-conditions and baseline models, using the same January 2005 through September 2010 time period over which the baseline model was calibrated and validated.

This analysis approach is flawed and misleading. It is inappropriate to model the impacts of periodically introducing Glade Reservoir water into Horsetooth Reservoir without also altering the modeled inflows and outflows of water in Horsetooth Reservoir that are expected under Alternative 2, as described in the SDEIS. The results of the comparison of the baseline and proposed-conditions models presented in the SDEIS were generated without reducing the inflows and outflows in Horsetooth Reservoir as expected, but rather, with the exact inflows and outflows observed from 2005 to 2010. As the proposed-conditions model is not fully simulating the conditions to be expected under Alternative 2, the proposed-conditions model results cannot be utilized to assess TOC concentrations to be expected under Alternative 2. The SDEIS does not adequately present results showing how Horsetooth Reservoir TOC concentrations would differ as a result of Alternative 2.

The modeling effort must be revised, as discussed above, to provide sufficient confidence as to the accuracy of the predicted TOC concentrations in Horsetooth Reservoir under the District's preferred alternative (Alternative 2) where water is delivered from Glade Reservoir into Horsetooth Reservoir. Specifically, the under predictions errors in the baseline model must be addressed; average TOC concentrations alone must not be used to evaluate impacts, and instead, event TOC

increases must be considered in evaluating impacts; and the proposed-conditions model must incorporate the modeled inflows and outflows of water in Horsetooth Reservoir that are expected under Alternative 2.

5.3 COMMENTS REGARDING IMPACTS TO THE POUDRE RIVER AND WASTEWATER DISCHARGERS

5.3.1 Augmentation Program and Wastewater Discharges

SDEIS Section 2.5.6, Flow Augmentation

Statement: "*The District proposes to include a flow augmentation program to improve Poudre River streamflows, primarily during winter months when flows are low and NISP would generally not be diverting, in Alternative 2 (both the Reclamation Action Option and the No Reclamation Action Option). […]A method of exchange to return the water to Glade Reservoir would be determined between the SDEIS and FEIS.*"

Comment: Diversions of water under NISP will decrease flows in the Poudre River downstream of the Poudre Valley Canal headgate, including at the permitted points of discharge for the Fort Collins Mulberry WRF and the Drake WRF. The SDEIS offers augmentation of flow just below the Larimer & Weld Canal headgate in cool months (1 November – 30 April) and in September as a means of offsetting decreased flows. Augmentation would extend downstream to the headgate of the Timnath Inlet, including past the location of the Mulberry WRF point of discharge. While the augmentation amount (to maintain a minimum of 10 cfs) is specified for the augmentation point just below the Larimer & Weld Canal, the expected augmentation flows reaching the downstream point of discharge for the Mulberry WRF are not specified, and may be lower than current flows, which would cause increasingly stringent effluent limits for Mulberry WRF, with attendant compliance costs. In addition, termination of augmentation at the Timnath Inlet headgate, which is upstream of the Drake WRF, will reduce the amount of dilution flow available at the Drake WRF. The augmentation is not secure for all months or for dry years and does not have a defined beneficial effect downstream at the discharge points for the wastewater treatment facilities of Fort Collins.

If the Corps approves NISP, it must require as a permit condition a requirement that Northern ensures that river flows immediately above the permitted point of discharge for the Mulberry WRF do not drop below 10 cfs, as measured by a continuous data logger at that location, and ensures that river flows immediately above the permitted point of discharge for the Drake WRF do not drop below 2 cfs, as measured by a continuous data logger at that location.

5.3.2 Use of Cottonwood Trees to Reduce Increase in Water Temperatures

SDEIS Appendix F, Section: 4.3.2, Channel and Habitat Improvements

Statement: "*Channel improvements in this reach would seek to narrow and deepen the current channel to be more consistent with current and future low-flow conditions and increase riparian vegetation, including larger plains cottonwoods that would shade the river channel. The effectiveness of these proposed improvements to cool water temperature would be verified during the detailed water quality modeling.*"

Comment: The reach of the Poudre River between the Poudre Valley Canal and the Hansen Supply Canal inflow is identified for mitigation through physical habitat improvement. Temperature, which

is regulated by the State for water quality protection, is one of the objectives for mitigation. As discussed above, water temperature in this cool water reach is expected to increase due to reduced flows, although the extent of temperature changes has not been analyzed by the Corps. The stated mechanism for mitigation of temperature in this cool water reach is the creation of new riparian shading.

There are flaws with this approach. First, this reach of the river is above the natural extent of plains cottonwoods which decrease in frequency as one moves upstream through the Fort Collins reach. Upstream of Fort Collins, the forests are dominated by narrowleaf cottonwood. Second, if part of the mitigation approach is to deepen the current channel, the bank topography will need to be adjusted to maintain river-floodplain connectivity. Without a link between the channel and the floodplain, periodic peak flows cannot support the establishment and survival of cottonwoods. Last, while shading is an important component of maintaining cooler temperatures, there will be a lag time (on the scale of multiple decades) before the trees provide this function. So, at minimum, in the interim, the Corps must require another plan to improve water temperatures. Further, without an assessment of the degree to which water temperature would change, there is no basis for assessing how adequate cottonwood shading would be in mitigating the impact.

The proposal to grow trees and then study the effectiveness through water monitoring *after* permitting represents a flaw prevalent throughout the SDEIS, i.e., inappropriately deferring analysis to a much later date when meaningful consideration should take place now. *See Kern*, 284 F.3d at 1075. NEPA prohibits "postpone[ing] analysis of an environmental consequence to the last possible moment." *Pacific Rivers Council*, 668 F.3d at 623. Further, the proposal to grow trees, without any analysis of the effectiveness of that measure, falls far short of NEPA's requirement that mitigation measures must be "reasonably complete." *See Robertson*, 490 U.S. at 352. It also fails to meet the requirements to avoid violation or exacerbation of water quality standards. *See* 40 C.F.R. § 230.10(b)(1).

The Corps must require a more rigorous and realistic program to reduce increased water temperatures resulting from NISP.

5.3.3 Trichloroethylene Plume at Glade Reservoir Forebay

SDEIS Appendix F, Section 3.4.1, Trichloroethylene Plume at Glade Reservoir Forebay

Statement: "*Trichloroethylene contaminated ground water is present beneath the northwest corner of the proposed forebay …The Corps and Northern Water would develop an agreement prior to construction of the forebay that determines the respective responsibilities of the Corps and Northern Water for implementing these mitigation measures.*"

Comment: Since 2008, significant progress has been made in remediating the TCE-contaminated groundwater plume at Missile Site 13. Efforts include installation of six additional monitoring wells, installation of 54 injection wells, subsequent oxidative treatments, and testing groundwater samples for the chemicals of concern. The Corps and its consultant, Tidewater, Inc., are reporting success with oxidative treatments in reducing contaminant levels in the plume (Corps 2014_a).

If the Corps approves NISP, it must require as conditions of a permit a definite obligation and clear definition of respective responsibilities of the Corps and Northern to the continue remediation efforts at Site 13 until repeat testing of the monitoring wells shows that the chemicals of concern in groundwater do not exceed the federal maximum contaminant level.

5.4 RESOURCES FOR SECTION 5

- CH2M. 2015. Technical Memorandum: Revised Costs for Impacts to Water Treatment Operations Resulting from NISP Operations. August 6, 2015.
- Dortch, Mark S. 1997. Water Quality Considerations in Reservoir Management. U.S. Army Engineer Waterways Experiment Station
- Northern Water. 2013. Three Lakes Water Quality and Operations … or why did Shadow Mountain turn green. Water Quality Stakeholders Meeting. March 4, 2014
- Smith, Steven B. 1982. Effects of Water Released from Stratified and Unstratified Reservoirs on the Downstream Water Quality. Arkansas Academy of Science Proceedings, Vol 36.
- U.S. Army Corps of Engineers (Corps). 2014. Final Decision Document for F.E. Warren Air Force Base, Former Atlas "E" Missile Site 13, LaPorte, Colorado. U.S. Army Corps of Engineers, Omaha District. September 24.
- U.S. Army Corps of Engineers (Corps 2014_a). 2014. Proposed Plan. Final. Groundwater Remediation at Former Atlas "E" Missile Site 13. July 2014.
- U.S. Army Corps of Engineers. 1997. Assessing Chemical Constituents in Reservoir Tailwaters. Technical Report W-97-1. August 1997.

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SECTION 6: OPERATIONAL COMMENTS

The SDEIS's description of Alternative 2 includes a proposed flow augmentation program ("Augmentation Program") and certain descriptions of other operations, such as deliveries to NISP Participants. However, the Augmentation Program is flawed, includes incorrect assumptions, and raises significant concerns regarding its operations that preclude the ability to rely on the use of the Augmentation Program as minimization or mitigation. The SDEIS also lacks needed analysis and specificity on various aspects of the proposed operations regarding Alternative 2.

6.1 INCLUSION OF THE AUGMENTATION PROGRAM IN ALTERNATIVE 2 ONLY

SDEIS Section 2.5.1, Introduction/Abstract

Statement: "*Augmenting flows in the Poudre River by releases from a designated 3,600-AF release pool in Glade Reservoir with a target of maintaining a 10-cfs flow below the Larimer-Weld Canal headgate in November through April and September 1 through September 30.*"

SDEIS Section 2.5.6, Flow Augmentation

Statement: "*The District proposes to include a flow augmentation program to improve Poudre River streamflows, primarily during winter months when flows are low and NISP would generally not be diverting, in Alternative 2 (both the Reclamation Action Option and the No Reclamation Action Option).*"

SDEIS Section 2.2.7.4, Winter Flow Augmentation in Alternatives 3 and 4

Statement: "*Infrastructure associated with a Reclamation Action Option was eliminated for Alternatives 3 and 4. There would be no pipeline to deliver water from Cactus Hill Reservoir to an upstream location near the diversion for Greeley's Bellvue Filter Plant or the Hansen Supply Canal outlet. Therefore, Alternatives 3 and 4 would not include a flow augmentation program analogous to the proposed for Alternative 2…*"

SDEIS Appendix F, Section 3.2.4, Low Flow Augmentation Release (FW-04)

Statement: "*To further improve the cold water fishery on the Poudre River from the canyon mouth through Fort Collins, Northern Water would integrate a flow augmentation program that would release water from Glade Reservoir to improve Poudre River streamflow from the canyon mouth through Fort Collins.*"

Comment: Alternative 2 (the District's preferred alternative) includes the Augmentation Program, which includes fall and winter releases from Glade Reservoir. No alternative other than Alternative 2 includes proposals analogous or similar to the Augmentation Program. The alternatives other than Alternative 2 thus lack the proposed avoidance and minimization enjoyed by Alternative 2. The SDEIS contains no analysis to explain why the other alternatives cannot contain proposals analogous or similar to the Augmentation Program. When impacts among alternatives are compared in the SDEIS, Alternative 2 consequently shows fewer negative impacts than other alternatives. This skews the analysis of impacts in favor of Alternative 2. Due to the selective inclusion of the Augmentation Program in Alternative 2, the SDEIS thus fails to properly analyze the various alternatives. In violation of NEPA and the CWA, the Corps has not "objectively evaluate[d] [the] reasonable alternatives" to the proposed action. 40 C.F.R. § 1502.14(a).

The SDEIS justifies the omission of an Augmentation Program for Alternatives 3 and 4 by pointing to the lack of a pipeline between the proposed Cactus Hill Reservoir and the Poudre River.

The SDEIS is unclear as to why such a pipeline could not be constructed to allow augmentation releases. Moreover, the Alternatives 3 and 4 could be formulated to include a Reclamation Action Option, which would then necessitate inclusion of a pipeline between Cactus Hill Reservoir and the Poudre River. As further explained in the comment on SDEIS Section 2.2.7.3 below, including a Reclamation Action Option as part of Alternatives 3 and 4 is reasonable considering the large amount of infrastructure required to deliver water from Cactus Hill Reservoir to Participants under a No Reclamation Action Option. Were a pipeline constructed between Cactus Hill Reservoir and the Poudre River pursuant to a Reclamation Action Option, augmentation releases could be provided by the alternative. To the extent that the Augmentation Program is avoidance and minimization, such proposals are necessary.

The Corps inclusion of the Augmentation Program in Alternative 2 only is arbitrary and demands further explanation. To comply with NEPA's requirement that it "rigorously explore and objectively" evaluate all alternatives, the Corps must assess Alternatives 3 and 4 with proposals analogous or similar to the Augmentation Program. *See* 40 C.F.R. § 1502.14(a).

6.2 INCLUSION OF RECLAMATION OPTION IN ALTERNATIVE 2 ONLY

SDEIS Section 2.2.7.3, Reclamation Action Option in Alternatives 3 and 4

> Statement: "*The Corps determined delivery of water by exchange, conveyance and/or storage using C-BT Project infrastructure was not practicable due to the location of the Cactus Hill Reservoir in Alternatives 3 and 4. […] The Corps therefore eliminated the Reclamation Action Option for Alternatives 3 and 4 from detailed analysis in the SDEIS.*"

Comment: The SDEIS eliminates a Reclamation Action Option from Alternatives 3 and 4 citing the difficulties in conveying water from Cactus Hill Reservoir at a distance of 30 miles back to Poudre River. No other justification for eliminating a Reclamation Action Option from Alternatives 3 and 4 is provided. In eliminating the Reclamation Action Option from Alternatives 3 and 4, the SDEIS does not provide a proper comparison of the two action alternatives with the proposed action (Alternative 2), particularly on the basis of project cost.

Despite dismissing the Reclamation Action Option out of concerns with pipeline distance and pumping inputs, Alternatives 3 and 4 propose pipeline routes in excess of 30 miles with multiple pumping stations to deliver water from Cactus Hill Reservoir to Participants, at a cost of $144,536,000 (SDEIS Table 2-12). As proposed in the comment above regarding SDEIS Appendix F, Section 3.2.4, constructing a pipeline between Cactus Hill Reservoir and the Poudre River would allow for releases from Cactus Hill Reservoir to be made back to the Poudre River, and would make practicable the Reclamation Action Option as well as the proposed Augmentation Program. Extending such a pipeline to Horsetooth Reservoir, similar to that proposed for Alternative 2, may be necessary to fully execute the Reclamation Action Option. Such a pipeline would raise water quality issues as discussed elsewhere in Fort Collins' comments. A Reclamation Action Option made available by constructing a pipeline between Cactus Hill Reservoir and the Poudre River would eliminate the need to construct the expansive distribution network proposed in Alternatives 3 and 4. As a result, it is possible that the Reclamation Action Option for Alternatives 3 and 4 would not result in a substantial capital cost relative to the total capital cost for the alternatives.

However, in order to properly compare costs between the Reclamation Action and No Reclamation Action Options for Alternatives 3 and 4, the Corps should disclose a comparative cost analysis.

As stated above, to comply with NEPA's requirement that it "rigorously explore and objectively" evaluate all alternatives, the Corps must assess Alternatives 3 and 4 with a Reclamation Action Option. The Corps must also conduct comparative cost analyses, as discussed above.

6.3 AUGMENTATION PROGRAM CONCERNS

SDEIS Section 2.5.6, Flow Augmentation

Statement: "*Water that is reduced to storage becomes the personal property of the District. The District intends to exercise its statutory right to release stored water for delivery downstream for a decreed beneficial use and to inform the state and division engineers that the water released from storage is to be shepherded downstream to a specified diversion point without being diverted by others, as required by Colorado law (Colorado Revised Status [CRS] 37-87-103)[…] For NEPA analyses, it was assumed that the flows would be re-diverted at the Timnath Reservoir (also known as Cache la Poudre Reservoir) inlet canal headgate […] A method of exchange to return the water to Glade Reservoir would be determined between the SDEIS and FEIS.*"

SDEIS Section 2.5.9.1, Sources of Water for Initial Fill of NISP Storage Reservoirs

Statement: "*Until operations of the SPWCP commenced, Glade Reservoir would be wholly dependent on the Grey Mountain water right.*"

SDEIS Appendix F, Section 3.2.4, Low Flow Augmentation Release (FW-04)

Statement: "*The following provides information on the low flow augmentation release program: … the average annual release to maintain this flow is not increased, and the other aspects of the program are not materially different from those proposed herein.*"

Comment: The Augmentation Program lacks the certainty needed to ensure that it will operate as claimed to achieve its goals, and that the intended avoidance and minimization will be accomplished. As discussed below, this lack of certainty creates the likelihood of legal challenges to the Augmentation Program, and/or a determination by the Colorado State and Division Engineers that Augmentation Program cannot be administered and/or is not lawful. Because of these uncertainties, the Corps cannot rely on the Augmentation Program as currently proposed to make the required findings under Section 404(b)(1) Guidelines. Problems with the Augmentation Program would cause Fort Collins to bear more impacts than determined by the Corps in the SDEIS, with limited recourse to resolve such issues. The following are specific issues regarding the Augmentation Program and proposals to address such issues.

6.3.1 Use of Water that Has Been Diverted to Storage

Comment: The SDEIS statements that "[w]ater that is reduced to storage becomes the personal property of the District" and that "[w]ater which is stored in Glade Reservoir would become the property of Northern Water" are not correct under Colorado law, as the Colorado Supreme Court explained in *Bijou Irrigation Dist. v. Empire Club*, 804 P.2d 175, 184 & n.15 (Colo. 1991). The Court explained that "[a]lthough we have stated that water once diverted becomes the personal

property of the appropriator … this somewhat overstates the scope of the right." *Id*. (citation omitted). "[W]ater diverted by exercise of a storage right must ultimately be applied to the beneficial use for which the water was appropriated." *Id*. at 184 n.15 (citations omitted).

Under Colorado law, the District only has the right to use the water it has diverted, into storage or otherwise, pursuant to the terms and conditions of its water rights. *Id*. *See also, e.g., Santa Fe Trail Ranches Prop. Owners Ass'n v. Simpson*, 990 P.2d 46, 54 (Colo. 1999). This legal error renders invalid the SDEIS analysis of the Augmentation Program, as discussed further below.

If NISP is approved, the Corps must require as a condition of the permit that all water rights proposed for use in the Augmentation Program be confirmed to be lawfully available for such proposed use pursuant to the terms and conditions of the subject water right decrees, Colorado law, and current administrative practices of the Colorado State and Division Engineers.

6.3.2 Proposed Use of the Grey Mountain Water Right for Replacement and/or Recreational Uses

Comment: The District proposes in the SDEIS to use water attributable to its Grey Mountain Water Right in the Augmentation Program by delivering water attributable to that water right to the Poudre River and re-diverting the water at the Timnath Inlet Canal headgate for further use. The Grey Mountain Water Right was originally confirmed as a conditional water right in the decree entered in Case No. 1980CW355, District Court, Water Division 1, with the decreed uses being irrigation, municipal, domestic, industrial, and production of electrical power and energy. *See* 80CW335 Decree at ¶3.I.

A decree continuing the conditional Grey Mountain Water Right was entered in Case No. 1989CW122, District Court, Water Division 1 (which had been consolidated with Case Nos. 1985CW206, 1985CW207, 1985CW208, 1985CW209, and 1985CW210). 85CW206 et al. Decree at ¶4 (identifying Case No. 1989CW122 and the Grey Mountain Water Right) and ¶18 (diligence finding). The decreed uses in that case are the same as stated in Case No. 1980CW355. *Id*. at ¶4.C. A decree continuing the conditional Grey Mountain Water Right was entered in Case No. 2001CW197, District Court, Water Division 1. The decreed uses in that case are the same as stated in Case No. 1980CW355 and Case No. 1989CW122. 01CW197 Decree at ¶7.F.

The Grey Mountain Water Right was changed in Case No. 2003CW405, District Court, Water Division 1, to add Glade Reservoir as an alternate place of storage and to add three alternate points of diversion; no changes to the decreed uses of the Grey Mountain Water Right were approved in that case. 03CW405 Decree at ¶¶4, 7.A. The decreed uses in that case are the same as stated in Case No. 1980CW355, Case No. 1989CW122, and Case No. 2001CW197. 03CW405 Decree at ¶6.b.e. There have been no other changes of the Grey Mountain Water Right. The Grey Mountain Water Right has not been decreed for reuse or successive use.

The most recent decree continuing the conditional Grey Mountain Water Right was entered in Case No. 2011CW242, District Court, Water Division 1, and identifies the decreed uses of the water right as irrigation, municipal, domestic, replacement, recreation, industrial, and production of

electrical power and energy. 11CW242 Decree at ¶7.1.7. In that case as in previous diligence cases (Case No. 89CW122 and Case No. 2001CW197), the District only invoked the Court's jurisdiction to seek findings of reasonable diligence and to continue the conditional Grey Mountain Water Right for another diligence period. *See* C.R.S. §37-92-301(4)(a)(I); *Dallas Creek Water Co. v. Huey*, 933 P.2d 27, 36-37 (Colo. 1997). The Court had no jurisdiction in Case No. 2011CW242to change the uses of the Grey Mountain Water Right, including no jurisdiction to add new uses to the Grey Mountain Water Right. *See* C.R.S. 37-92-302; *Matter of Application for Water Rights v. Columbine Assoc.*, 993 P.2d 483, 489 (Colo. 2000).

The only currently decreed uses of the Grey Mountain Water Right that could potentially relate to the Augmentation Program are replacement and recreation. However, as discussed above, any replacement or recreation use of the Grey Mountain Water Right is not a lawful use of that water right because the Court had no jurisdiction to add such new uses. Such jurisdictional defects can be raised at any time. *E.g., id*. at 488. To the extent that the use of the Grey Mountain Water Right's proposed use in the Augmentation Program is replacement or recreation use, such proposed use may not be administered by the Colorado State and Division Engineers and is vulnerable to a legal challenge, unless the water right is changed in proceedings before the District Court, Water Division 1. C.R.S. §37-92-305(3)(a).

If the Corps approves NISP, it must require as a condition of the permit that the Grey Mountain Water Right may not be included in the Augmentation Program unless and until the District receives judicial approval for a change of use of the Grey Mountain Water Right pursuant to C.R.S. §37-92-305(3)(a), or temporary approval from the State Engineer for a change of use of the Grey Mountain Water Right pursuant to C.R.S. §37-92-308 or successor statutes, such that the Grey Mountain Water Right can be used in the Augmentation Program. Provided that such a proposed change of water right were shown to not adversely affect Fort Collins' water rights, Fort Collins would likely not oppose such a change of the Grey Mountain Water Right. If the Corps must rely on the Augmentation Program to make its LEDPA and other findings, then no action under a permit shall be allowed unless and until the District receives such approvals.

The District could also include other water rights in the Augmentation Program that are currently legally available for the appropriate uses. The District's water rights decreed in Case No. 1992CW130, District Court, Water Division 1, may be such water rights. However, to the extent that such water rights are not or will not be available when needed under the Augmentation Program, any approval of NISP must require the District to acquire ownership of, or the right to use other water rights and to dedicate them to the Augmentation Program. For instance, various senior water rights have been previously changed for various new uses and decreed for storage in Glade Reservoir, which may be a source of water rights for the Augmentation Program. Other water rights are used to import water into the Poudre River Basin, which may be a source of water rights for the Augmentation Program. Further, water diverted during "free river" conditions, when there is no downstream call, could be attributed to a junior and undecreed "free river" water right (and not the Grey Mountain Water Right) and may be available for use in the Augmentation Program.

The above concerns regarding the uses of the Grey Mountain Water Right would also be addressed if the District were simply relinquishing water from storage to the stream or if the water

were being delivered in the Poudre River stream channel for re-diversion (directly or by exchange) for a decreed beneficial use downstream, both assuming that the water so relinquished would reach the desired location(s), as discussed further below.

Whichever other water rights are used, or however the Augmentation Program may be re-formulated, any approval of NISP must require the District to identify and substantiate the legal and physical availability of water under such water rights for use in the Augmentation Program to guarantee that the proposed Augmentation Program will be achievable.

6.3.3 Proposed Re-Use and Successive Use of Water Attributable to the Grey Mountain Water Right

Comment: Even if the Grey Mountain Water Right can be used for replacement or recreation use in the Augmentation Program, its proposed reuse and successive use, as described in the SDEIS, is in violation of the decrees confirming the water right. Water attributable to a tributary water right, like the Grey Mountain Water Right, that has not been delivered into an unconnected stream system can only be used once, unless it is decreed for reuse and successive use. *WSSC v. Curtis*, 733 P.2d 680 (Colo. 1987). *See also Denver v. Fulton Irrigating Ditch Co.*, 506 P.2d 144, 146-47, 179 Colo. 47, 52 (1972) (defining reuse and successive use). If not decreed for reuse or successive use and not delivered into an unconnected stream system, the return flows from the first use of the water can only be re-diverted under a separate water right. *Santa Fe Trail*, 990 P.2d at 54.

The Grey Mountain Water Right is not decreed for reuse or successive use and water attributable to the water right will only be used within the South Platte River basin, which includes the Poudre River basin. Therefore, once water attributable to the Grey Mountain Water Right is used the first time, such as delivering it to the Poudre River for replacement or recreation use in the Augmentation Program, the District has no right to reuse and re-divert it under the Grey Mountain Water Right. The District can instead only re-divert the water under a separate water right. However, no such other water right is identified in the SDEIS.

If the Corps approves NISP, it must require as a permit condition that water attributable to the Grey Mountain Water Right may not be reused or successively used under the Augmentation Program, or otherwise, unless and until the District receives judicial approval for a change of use of the Grey Mountain Water Right pursuant to C.R.S. §37-92-305(3)(a), or temporary approval from the State Engineer for a change of use of the Grey Mountain Water Right pursuant to C.R.S. §37-92-308 or successor statutes, such that water attributable to the Grey Mountain Water Right can be reused and successively used. Provided that such a proposed change of water right were shown to not adversely affect Fort Collins' water rights, Fort Collins would likely not oppose such a change of the Grey Mountain Water Right.

To the extent that the District intends to re-divert water used in the Augmentation Program, the District could include other water rights in the Augmentation Program that are legally available for reuse and successive use. The District's water rights decreed in Case No. 1992CW130, District Court, Water Division 1, may be such water rights. However, to the extent that such water rights are not or will not be available when needed under the Augmentation Program, any approval of NISP

must require the District to acquire ownership of, or the right to use other water rights and to dedicate them to the Augmentation Program. For instance, various senior water rights have been previously changed for reuse. Other water rights are used to import water into the Poudre River Basin, which may be a source of reusable water. Further, water diverted during "free river" conditions when there is no downstream call could be attributed to a junior "free river" water right (and not the Grey Mountain Water Right) and may be available for reuse and successive use.

Whichever other water rights are used or however the Augmentation Program may be re-formulated, the Corps must require the District to identify and substantiate the legal and physical availability of water under such water rights for reuse and successive use in the Augmentation Program to guarantee that the proposed Augmentation Program will be achievable.

6.3.4 No Analysis of Substitutions and Exchanges on Augmentation Program Flows

Comment: The SDEIS statements that CRS §37-87-103 entitles the District to use the natural stream for the delivery of water without others using such water are incorrect. Other water users may divert such water provided that they deliver a substitute supply above the point of re-diversion. *E.g.*, C.R.S. §37-92-305(5); *Empire Lodge Homeowners' Ass'n v. Moyer*, 39 P.3d 1139, 1153-55 (Colo. 2001). As described in the SDEIS, the District currently lacks a legal mechanism to ensure that water proposed to be delivered from Glade Reservoir to the Timnath Inlet Canal headgate is protected from intervening diversions, substitutions, and exchanges. Section 3.2.5 of Appendix F of the SDEIS confirms the District's current inability to protect such flows. The SDEIS contains no analysis of how the District will ensure that such deliveries of water will actually remain in the Poudre River to avoid and minimize the reduction of flows.

To comply with NEPA and the CWA, the Corps must require an analysis be performed to demonstrate that deliveries of water under the Augmentation Program will actually remain in the Poudre River to avoid and minimize the reduction of flows. The Corps must require additional measuring stations to establish that deliveries of water under the Augmentation Program are not diverted and substituted. To the extent that the Augmentation Program constitutes mitigation, under the Section 404(b)(1) Guidelines, the Corps' mitigation must "have been demonstrated to be effective in circumstances similar to those under consideration." 40 C.F.R. § 230.75(d). *See Kentucky Riverkeeper v. Rowlette*, 714 F.3d 402, 412 (6th Cir. 2013) (The Corps' "mere listing of mitigation measures and processes, without any analysis, cannot support a cumulative impacts determination."). Any approval of NISP must require a high level of certainty that the water delivered to the stream under the Augmentation Program will actually reach its intended destination so as to guarantee that the proposed Augmentation Program will be achievable. In violation of NEPA and the CWA, the SDEIS fails to demonstrate that the Augmentation Program would be viable and effective to meet its goals. *See Robertson*, 490 U.S. at 352.

6.3.5 No Analysis of the Ability of the District to Deliver Flows in the Augmentation Program Past All Intervening Headgates

Comment: The SDEIS indicates that water in the Augmentation Program would be delivered to the Poudre River "via a pipeline to the river upstream of the Larimer County Canal headgate." This

would mean that the Colorado State and Division Engineers would need to shepherd such water past the following diversion structures to reach the Timnath Inlet Canal headgate: (1) the diversion structures for the Larimer County Canal headgate; (2) the diversion structures for Watson Lake; (3) the diversion structures for the Jackson Ditch (a.k.a Dry Creek Ditch); (4) the shared the diversion structures for the New Mercer Ditch, Larimer County No. 2 Ditch, Little Cache la Poudre Ditch, and Taylor and Gill Ditch; (5) the diversion structures for the Arthur Ditch; (6) the diversion structures for the Larimer and Weld Canal; and (7) the diversion structures for the Lake Canal. The majority of these diversion structures lack necessary measurement structures to ensure that water can be shepherded past them, especially during periods of low flow or when the ditch is diverting the entire flow of the river.

While the NISP Proposed Conceptual Mitigation Plan (Appendix F, Section 4.4.3) provides for multi-objective retrofits for three of the above diversion structures (the Watson Lake, Terry Lake, and Larimer and Weld diversions) that may allow for streamflow monitoring, other diversions listed above will not have associated streamflow monitoring, and thus cannot be ensured to bypass flows attributable to the Augmentation Program. The SDEIS contains no analysis of how the District will ensure that such deliveries of water in the Poudre River will actually reach the desired downstream location.

To comply with NEPA and the CWA, an analysis must be performed to establish that deliveries of water under the Augmentation Program will be delivered past all intervening headgates so as to guarantee that the proposed Augmentation Program will be achievable.

6.3.6 Augmentation Program During Times of Drought

Comment: The SDEIS indicates that releases of water under the Augmentation Program may not occur under extreme drought conditions when Glade Reservoir storage contents are less than 30% of capacity. According to Figure 3.15 of the SDEIS Operations Plan Report, Glade Reservoir would drop below 30 percent of capacity (or 51,000 acre-feet of the proposed 170,000 acre-feet) in the late 1950s, the mid-1990s and the mid-2000s conditions– indicating that the Augmentation Program may not occur three times during the study period of 1950 through 2005. However, a comparison of pre- and post-augmentation flows (assessed through PPP and final flow data provided by the Corps) indicates the augmentation flows occurred during these same years and were thus included in the impacts analysis, which therefore improved environmental outcomes. It is likely that such drought conditions will coincide with low flows in the Poudre River, including flows less than 10 cfs below the Larimer and Weld Canal headgate. However, by its own proposed terms and conditions the Augmentation Program would not operate when most needed. The failure of the Augmentation Program to address the effects of diversions to Glade Reservoir when the effects are being most intensely experienced undermines the purposes of the Augmentation Program. The impacts from the Augmentation Program must be specifically addressed.

The Corps must require that the Augmentation Program operate at all times, including during extreme drought years when augmentation flows are needed the most, in order to address impacts, as claimed.

6.3.7 No Analysis of Subsequent Exchanges Using Augmentation Program Flows

Comment: The SDEIS states that water released from Glade Reservoir for the Augmentation Program will be returned to Glade Reservoir, possibly through the use of exchanges. However, the actual method of exchange to return the water to Glade Reservoir is not specified in the SDEIS.

The SDEIS fails to explain how such exchanges would occur under the subject water right decrees. For example, the decree entered in Case No. 1992CW130, District Court, Water Division 1, approved certain conditional appropriative rights of exchange, with findings of diligence for those conditional exchanges having been entered in Case No. 2011CW241, District Court, Water Division 1. The sources of water for those exchanges are (1) water diverted under the SPWCP water rights confirmed in Case No. 1992CW130 and (2) water from other reusable sources, provided that such use is allowed by another decree and is agreed to by the sources' owners. As discussed above, water attributable to the Grey Mountain Water Right is not currently legally available for use as a source of water for these exchanges. The SDEIS contains no analysis of these aspects of these unspecified exchanges.

Exchanging augmentation releases back to Glade Reservoir has the potential to reduce Poudre River streamflows along the 12 mile reach through Fort Collins between the proposed augmentation release point and the Timnath Inlet Canal headgate, and may result in impacts to the Poudre River's aquatic environment, which are discussed elsewhere in these comments.

To comply with NEPA and the CWA, the SDEIS must clearly describe the method and frequency of which these exchanges will be conducted, and must consider and quantify the environmental impacts with associated streamflow depletions from all exchanges.

6.4 IMPACTS ON THE PVP

SDEIS Section 2.5.5.2.1, Deliveries to Participants / Reclamation Action Option

Statement: "*Fort-Collins-Loveland Water District (3,000 AFY) would use its own capacity in the existing Pleasant Valley Pipeline by direct connection from Glade Reservoir.*"

Comment: Alternative 2 (the District's preferred alternative) includes a direct connection between Glade Reservoir and the PVP. Fort Collins and the Tri-Districts (the East Larimer County Water District, the Fort-Collins-Loveland Water District, and the North Weld County Water District) share use of the PVP to deliver water to Fort Collins' and the Tri-Districts' respective water treatment facilities. As discussed in other sections of these comments, the water released from Glade Reservoir will be of a lower quality than other water that has historically been delivered through the PVP. As one example, water released from Glade Reservoir may have high levels of TOC. Releases high in TOC from Glade Reservoir to the PVP will degrade the quality of raw water to Fort Collins treatment plant and necessitate more intensive treatment, as discussed below.

Unless the quality of water released from Glade Reservoir and delivered to the PVP is acceptable to Fort Collins, Fort Collins may exercise its rights to withhold approval of such use of the PVP pursuant to Paragraph 3.a of the Allotment Contract with the Northern Colorado Water

Conservancy District, acting by and Through the Pleasant Valley Pipeline Water Activity Enterprise and the City of Fort Collins Water Utility Enterprise for Capacity in the Pleasant Valley Pipeline, dated February 28, 2003.

The measures and alternative analysis required in Section 5.2.5 of these comments apply here as well. The Corps must also analyze how Alternative 2 would work without this connection.

6.5 HOW DELIVERIES TO NISP PARTICIPANTS ARE TO BE MADE

SDEIS Section 2.5.5.2.1. Deliveries to Participants / Reclamation Action Option

Statement: "*Eaton, Severance, and Windsor (5,900 AFY) would be by direct pipeline connection from Glade Reservoir to the Soldier Canyon Filter Plant.*"

SDEIS Appendix F, Section 3.2.1, Avoid Munroe Canal Diversions (FW-01)

Statement: "*The original Draft EIS considered using the Munroe Canal for two operations associated with NISP. […] The exchange has been eliminated in the SDEIS analysis, and replaced with a new pipeline directly from Glade Reservoir to the Pleasant Valley Pipeline (for Fort Collins-Loveland Water District) and a new pipeline directly from Glade Reservoir to the Soldier Canyon Filter Plant (for Eaton, Severance and Windsor).*"

Comment: The SDEIS mentions that the NISP participants of Eaton, Severance, and Windsor would receive water via a direct connection between Glade Reservoir to Soldier Canyon Filter Plant. However, the Corps must provide additional information regarding the pipeline(s), including, but not limited to, its route(s), what land(s) would be disturbed by its construction and use, how the proposed pipeline(s) would be constructed and operated, the socioeconomic impacts of such pipeline(s), and whether environmentally sensitive or affected areas would be involved. To comply with NEPA and the CWA, the SDEIS must evaluate the impacts of any delivery pipeline(s). If the deliveries are proposed to be made through the PVP, Fort Collins' comments above regarding the PVP apply.

6.6 RESOURCES FOR SECTION 6

- Decrees, District Court, Water Division 1: Case No. 1980CW335; Consol. Case Nos. 1985CW206, 1985CW207, 1985CW208, 1985CW209, 1985CW210, 1989CW122; Case No. 2001CW197; Case No. 1992CW130; Case No. 2003CW405; Case No. 2011CW242.

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SECTION 7: CHANNEL STRUCTURE, STORM WATER, FLOODPLAIN, AND HYDRAULIC COMMENTS

Fort Collins is located in the Poudre River basin, and thus, the Poudre River is the primary conduit for drainage, storm water, flood waters, and other flows. As discussed herein, NISP's alterations to, among other things, stream morphology and sediment transport, will adversely affect Fort Collins' use of the Poudre River for these services.

The City of Fort Collins' Strategic Plan recognizes the importance of the Poudre River to environmental health, community safety, recreation and economic health. Strategic Objective 4.1 call for Fort Collins to improve and protect wildlife habitat and the ecosystems of the Poudre River and other urban streams. This plan also recognizes that the Poudre River has multiple and, at times, competing demands from various users, while at the same time being a natural amenity and ecosystem to be carefully nurtured and maintained. The plan thus directs that, given multiple stresses on the ecology of the Poudre River, there will be a need for local and regional investments if river health is to be maintained and/or improved. The plan also identifies that a healthy Poudre River supports the economy of downtown Fort Collins.

The stream morphology and sediment transport analysis in the SDEIS contain some important analyses that were originally omitted from the DEIS. However, these analyses and the conclusions drawn from them are fundamentally flawed because the sediment transport modeling underpinning the new analyses is incorrect, as discussed below. Thus, without further and independent evaluation of hydraulic modeling by the Corps, the impacts of the proposed action cannot be determined.

In addition to errors in the modeling, the SDEIS fails to properly analyze likely extent of channel changes, sediment deposition, and other impacts to habitat quality that are not well supported by the analyses and evidence provided in the SDEIS. These fundamental flaws in the sediment transport analyses result in underestimation of NISP impacts to various river characteristics including channel capacity to convey floods, aesthetics, and physical habitat for aquatic life.

7.1 NO ANALYSIS OF COSTS AND FLOODING RISKS IN FORT COLLINS

SDEIS Section 3.4.2.4, Morphologic and Sediment Transport Conditions Upstream of I-25

Statement: "*Stream morphology in the upstream reaches from the canyon through Fort Collins to the vicinity of I-25 is flood-dominated morphology. […] Deposition and vegetation encroachment will continue in discrete areas – probably at a similar rate to the current unless some unpredicted intrinsic threshold is reached or some other change occurs such as an invasion of reed canary grass or a substantial increase in sediment supply from upstream sources.*"

Comment: The SDEIS fails to address how much additional sediment is expected to accumulate in the Fort Collins reach of the Poudre River following construction of NISP. This information is needed to assess the cost of damages and other impacts to Fort Collins on an annual basis to determine proper compensatory mitigation. Based on historic sediment removal projects in Fort Collins, the cost to remove sediment from the river can vary from $20 to $80 per ton depending on

location, hauling distance, equipment used, and type of material. These efforts also have environmental impacts that must be considered when evaluating the impacts of NISP.

The SDEIS geomorphic analysis fails to properly assess the potential for decreased flood conveyance capacity and increased flood depths associated with channel aggradation, narrowing, and vegetation encroachment within Fort Collins. This is a point that must be addressed with regard to public safety and potential costs to Fort Collins. Fort Collins has an interest in maintaining a healthy and functional river system which retains an open channel capable of transporting storm water and flood flows. The process of sediment deposition without the process of sediment flushing through scouring and erosion will lead to vegetation encroachment and subsequent channel constriction. These changes will significantly change the Poudre River's function as a conveyor of flood water and result in flow obstruction, increased flood stages and possibly greater flood damage in the future.

The SDEIS's characterization that the Poudre River transitions from a sediment "supply limited" to sediment "transport limited" system at its crossing of I-25 is a generalization that fails to address the impacts of NISP on specific reaches of the Poudre River throughout Fort Collins. More detailed analysis and mitigation actions for specific reaches within Fort Collins must be developed prior to approval of NISP. Reduction of runoff peak flows will likely increase sedimentation within Fort Collins, thereby exacerbating flooding risk.

Under NEPA and the CWA, the Corps must take a hard look at the additional sediment accumulation and associated impacts in the Fort Collins reach of the Poudre River that may be caused by the proposed action. It must also determine and document the mitigation measures that would adequately address those impacts. *See* 40 C.F.R. § 230.11. As stated above, unless these measures are properly identified and addressed, the Corps "has not met its legal obligation and any proposed mitigation measures dependent upon an incomplete environmental impact analysis necessarily fail . . . ." *Ohio Valley Envtl. Coalition*, 479 F.Supp.2d at 627.

7.2 LACK OF SUPPORT FOR CONCLUSIONS OF MINOR IMPACTS

SDEIS Section 4.4.3.1.1, Poudre River Flows and Flooding

Statement: "*Widespread 20% to 35% predicted reductions in flows around the 1% to 5% flow range may have an impact on channel forming discharges and channel morphology.*"

SDEIS Section 4.4.3.1.1, Poudre River Sediment Transport

Statement: "*Under Alternative 2, it is possible that the reduced incidence of flows around the current 1- and 2-year flood level would increase the likelihood that colonizing vegetation can become established before it is scoured out by subsequent high flows. Channel contraction can then be driven by vegetation in the absence of abundant sediment.*"

SDEIS Section 4.4.7.1, Impact Summary Poudre River, Table 4-53, Page 4-173

Statement: "*Effects of Alternative 2 on geomorphology and sediment transport may result in a detectable change that is considered to be minor in the reaches upstream of I-25. Downstream of I-25 Alternative 2 effects may result in a clear detectable change that is considered to be moderate.*"

Stream Morphology and Sediment Transport Cache La Poudre River Mainstem, Final Project Effects Report, Section 1.5.1, Trajectory Upstream of I-25, Page 1-8

Statement: "*Despite the relative stability of the existing condition, there is still a propensity to aggradation, constrained in the current condition by the limited availability of incoming sediment compared to the ability of the channel to transport it. Deposition and vegetation encroachment will continue in discrete areas – probably at a similar rate to the current…*"

Comment: The SDEIS generally underestimates the likelihood of sediment deposition, vegetation encroachment, channel shrinking, and lost flood conveyance through Fort Collins. On this issue, the SDEIS contains numerous examples of conclusions that run contrary to presented data and analyses with respect to the current trajectory and likely response of the river channel in Fort Collins. There also are numerous examples of the SDEIS contradicting itself. Under NEPA and the CWA, the Corps' explanation is not "satisfactory" if the "explanation for its decision . . . runs counter to the evidence before" it. *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

As one example, the Stream Morphology and Sediment Transport Cache La Poudre River Mainstem, Final Project Effects Report, dated August 15, 2014 ("Effects Report"), at pages 1-7, states that "[u]pstream of I-25 the river channel is larger and steeper but there is also a strong aggradational tendency associated with reduced flows." Yet the Effects Report ultimately concludes that the river through Fort Collins will remain "supply limited" and unresponsive relative to downstream reaches because there is not enough sediment supply to cause any more than "minor" aggradation. In contrast, the Poudre River downstream of I-25 is deemed "transport limited" and more at risk, owing to its relatively high sediment supply (e.g., Table 4-53, p. 4-172 of main SDEIS document).

As another example, the SDEIS identifies widespread 20% to 35% reductions in flows, as quoted above, early in Section 4 of the SDEIS. SDEIS, Section 4.4.3.1.1 at 4-157. However, by the end of Section 4 in the SDEIS, this impact is marginalized on the basis of a supply limited condition upstream of I-25. A supply limited condition does exist upstream of I-25 that does not preclude episodes of high sediment loading, such as after a wildfire or slope instability somewhere in the watershed. Nevertheless, the reduction of high flows by NISP will clearly impact the ability of the channel to flush excess sediment through Fort Collins when these events do occur. More specifically, the SDEIS concluded that "[f]or the 26-year period of record, 23 flushing events under Current Conditions lasting for 325 days in total would become 16 flushing events under Alternative 2 lasting for 222 days in total." SDEIS, Section 4.4.3, page 4-158. This reduced flushing potential under NISP will impact channel conditions, particularly after high sediment producing events, resulting in changes in channel morphology. And yet the discussion in this section concludes with a statement that the effects of Alternative 2 on geomorphology and sediment transport is "minor in the reaches upstream of I-25." (Table 4-53, page 4-173).

As one further example, the SDEIS identifies the possibility that reduced flows will increase vegetation and channel contraction, as quote above, early in Section 4. SDEIS, Section 4.4.3.1.2 at 4-160. However, by the end of Section 4 this possible impact is largely overlooked given the conclusion of "minor" impacts (Table 4-53, page 4-173). With the substantially reduced flow

conditions under NISP, vegetation encroachment will occur on sand and gravel bars that were previously more frequently inundated. The supply limited condition upstream of I-25 may reduce the potential of fluvial sediment deposits on exposed bars that would facilitate vegetation encroachment, however, some sediments will still accumulate (including Aeolian sediment) and vegetation encroachment will occur in the Fort Collins reach under NISP.

The above conclusions from the SDEIS are not supported by evidence and are in conflict with general principles of stream morphology. First, aggradation or deposition of sand and fine sediment depends on the supply of sediment relative to the capacity of the river to transport the supplied sediment, not just the supply of sediment. If capacity to move sediment is sufficiently reduced, a "supply limited" channel will shift to transport limitation and sediment accumulation will accelerate. Second, the vast majority of the sand and coarse sediment load that is supplied to the Timnath and Windsor reaches of the Poudre first flows through Fort Collins. Third, Alternative 2 would decrease the sediment transport capacity of the river through Fort Collins to a level below that currently found in the Timnath reach that extends four miles downstream of I-25. The tables below summarize modeling results compiled from the Effects Report to compare current conditions in Timnath and Windsor with Alternative 2 conditions in Fort Collins.

Excerpt from Table 3.2 Exceedance Probability Discharge, Alternative 2 vs Current Conditions (Effects Report p 3-5):

Location	Node	CTP Scenario	Exceedance	Flow (cfs)
Fort Collins	17	Alt 2	1% flow	2023
Fort Collins	20	Alt 2	1% flow	2037
Fort Collins	23	Alt 2	1% flow	2089
Timnath	32	Current	1% flow	2200
Timnath	34	Current	1% flow	2297
Windsor	35	Current	1% flow	2358
Fort Collins	17	Alt 2	2% flow	1348
Fort Collins	20	Alt 2	2% flow	1316
Fort Collins	23	Alt 2	2% flow	1285
Timnath	32	Current	2% flow	1603
Timnath	34	Current	2% flow	1674
Windsor	35	Current	2% flow	1711

Excerpt from Table 3.11 Reach Averaged Sediment Transport Potential using SIAM – Alternative 2 vs Current Conditions (Effects Report p 3-32):

Difference between Current average transport of sand and gravel in Fort Collins as compared to Current in Timnath	15%
Difference between Current average sand transport in Fort Collins as compared to Current in Timnath	18%
Difference between Alt 2 average transport of sand and gravel in Fort Collins as compared to Current in Timnath	-10%
Difference between Alt 2 average sand transport in Fort Collins as compared to Current in Timnath	-12%

Note: Data in the table above compares 6 out of 7 SIAM reaches in Fort Collins (omitted outlier reach FC 3) with Timnath A reach which extends 4 miles below I-25.

These SIAM modeling results indicate that Alternative 2 would reduce sediment transport capacity of the Poudre River in Fort Collins to levels below the transport capacity currently witnessed in Timnath. The Poudre River in Timnath immediately below I-25 is described in the Stream Morphology and Sediment Transport Cache la Poudre River Mainstem Baseline Report, dated May 2013 ("Baseline Report"), as being dominated by fine sediment deposition which reinforces vegetation encroachment and loss of channel flood conveyance. (Note that the SIAM analysis still uses the Meyer-Peter Mueller transport equation which underestimates differences in sediment transport capacity for river bed particles near the threshold of motion). Ultimately, the SDEIS presents no meaningful evidence to support the conjecture that the Poudre River in Fort Collins will sustain only "minor" aggradation, and remain supply limited given reductions of sediment transport capacity of approximately 30-35% in some reaches (Table 7.12 on p. 7-33 in the Effects Report). Instead, the SIAM hydraulic modeling results indicate that the Poudre River in Fort Collins is on the cusp of shifting to a flow and sediment regime similar to current conditions in Timnath downstream of I-25.

The SDEIS only addresses the risk of lost flood conveyance downstream of I-25 (SDEIS main report p. 4-159). This implies that effects in Fort Collins will be negligible despite increased risk of sediment accumulation, channel shrinking, woody vegetation encroachment, and increased potential of debris impacts to flood conveyance at bridges and other hydraulic structures. This implicit conclusion is not supported with any empirical or modeling evidence in the SDEIS documentation. Although Alternative 2 will likely result in increased vegetation encroachment and reduce channel conveyance capacity in the absence of periodic channel maintenance flows, it would not reduce the magnitude of the most extreme flow events delivered to the Fort Collins river segment (e.g., 50-100+ year floods). This means that 100 year and larger flood stages could appreciably increase and create a public safety and cost issue for Fort Collins. Additional analysis is needed to address the risk of lost flood conveyance in Fort Collins.

NEPA requires an "accurate scientific analysis." 40 C.F.R. § 1500.1. "For this reason, agencies are under an affirmative mandate to 'insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements …" *Envtl. Defense v. Corps of Engineers*, 515 F. Supp. 2d 69, 78 (D.D.C. 2007). To address these deficiencies, the Corps must conduct further analyses in a revised DEIS or supplement to the SDEIS. Under NEPA and the CWA, the Corps "must articulate why it has made its decision with sufficient clarity that others affected by the decision and the Courts can understand it." *Crutchfield v. United States Army Corps of Engineers*, 154 F. Supp. 2d 878, 899 (E.D. Va. 2001).

7.3 INCORRECT ANALYSIS OF STREAM MORPHOLOGY AND SEDIMENT TRANSPORT

Effects Report, Section 3.6.2, Spells Analysis at Representative Cross Sections for Flows that Initiate Motion of Bed Material, Page 3-9

Statement: "*The spells analysis suggests that the time between occurrences of bed material motion is not generally increased under Alternative 2, so to the extent that colonization of vegetation is dependent on the existence of a stable substrate, no significant change in the rate or extent of new colonization is expected.*"

Comment: SDEIS analyses of sediment mobilization use inappropriate methods to estimate the flows at which river bed flushing and rejuvenation occur. The equation from Ackers and White (1973; p.6-10 of Baseline Report) was not intended for this application nor calibrated for the prevailing grain sizes in the Poudre River in Fort Collins. The equation is used to adjust shear stress output from HEC-RAS modeling. This erroneous application of shear stress "partitioning" biases the results such that it appears that there is little sediment flushing occurring under baseline conditions, and ultimately masks the net reduction in sediment flushing that occurs under Alternative 2.

To investigate this bias, Fort Collins re-ran the HEC-RAS model used in the SDEIS analyses and computed four standard estimates of shear stress using main channel shear, hydraulic depth and friction slope, maximum depth and friction slope, and a well-known standard relationship for estimating grain shear in gravel bed rivers. All these accepted methods result in significantly greater sediment flushing and mobilization potential compared to values reported in the SDEIS. *See* Bledsoe, B. (2015). Technical Memorandum: Northern Integrated Supply Project - Supplemental Draft EIS Flushing Flow Analysis.

This one source of bias in shear stress estimates produces errors averaging 52% with some errors exceeding 80% at the SDEIS "representative" cross-sections that were selected in the Fort Collins reach. Furthermore, the selection of single "representative" cross-sections to represent several thousand feet of river channel in the SDEIS is not explained and justified. Based on analysis of HEC-RAS model outputs, some of these sections appear to not be representative of reach wide conditions due to their hydraulic characteristics proximity hydraulics structures (see for example the "representative" cross-section at station 231,351 which is located immediately upstream of a bridge in Fort Collins).

The Corps must conduct additional studies using appropriate methodologies to address the deficiencies described above, specifically with respect to using standard estimates of shear stress using main channel shear, hydraulic depth and friction slope, maximum depth and friction slope, and a well-known standard relationship for estimating grain shear in gravel bed rivers, as opposed to using the equation from Ackers and White identified above.

7.4 INCORRECT DATA ON GRAIN SIZE

Effects Report, Section 3.6.2, Spells Analysis at Representative Cross Sections for Flows that Initiate Motion of Bed Material,Ppage 3-9

> Statement: "*The spells analysis suggests that the time between occurrences of bed material motion is not generally increased under Alternative 2, so to the extent that colonization of vegetation is dependent on the existence of a stable substrate, no significant change in the rate or extent of new colonization is expected.*"

Comment: The grain size data that were chosen to estimate NISP effects on river bed flushing and mobility are biased toward the coarsest material relative to data obtained through more intensive substrate monitoring conducted by Colorado State University ("CSU"). By utilizing the coarsest available grain size data (collected using sampling methods that yield less accurate estimates than

the CSU samples), the SDEIS analyses are further biased (in conjunction with the first point in the paragraph above) toward underestimation of differences in how often and effectively the river bed is cleaned by current flows versus Alternative 2 flows.

The CSU grain size data were provided to the Corps and NISP consultants and are acknowledged and reported in the Baseline Report (Figure 3.8, p. 3-13 of Baseline Report). However, these data do not appear in subsequent grain size plots and analyses. As a result of the combined influence of underestimated shear stresses and selection of very coarse grain sizes, as described in the previous comment, the SDEIS generally contends that extreme flows are required for river bed cleaning in Fort Collins. By contrast, standard methods indicate that sediment can be flushed and the river bed rejuvenated with flows of 2,000 to 3,500 cfs at most locations. Bledsoe, B. (2015). Technical Memorandum: Northern Integrated Supply Project - Supplemental Draft EIS Flushing Flow Analysis. This is important because Alterative 2 can divert 1,000 cfs. This amount of flow diversion would be the difference between flushing and not flushing the river bed in many years. These errors propagate through all the other analyses of physical-biological linkages (e.g., modeling future trout habitat or the risk of algae proliferations). The lack of bed mobility has broad implications to the Poudre River ecosystem as discussed throughout the comments herein.

NEPA requires that the Corps conduct additional studies using appropriate methodologies to address the deficiencies described above, specifically with respect to the use of CSU grain size data and the determination of flushing flows.

7.5 AUGMENTATION PROGRAM'S ABILITY TO MAINTAIN THE ENVIRONMENT

SDEIS Appendix F, Section 3.2.4, Low Flow Augmentation Release (FW-04)

Statement: "*To further improve the cold water fishery on the Poudre River from the canyon mouth through Fort Collins, Northern Water would integrate a flow augmentation program that would release water from Glade Reservoir to improve Poudre River streamflow from the canyon mouth through Fort Collins.*"

Comment: The Augmentation Program is narrowly conceived. An extensive body of science is clear that a range of flows from low to high is necessary for maintenance of the environment. At present, the plan only proposes the maintenance (at most times) of 10 cfs.

There is no proposal for impacts to flushing flows, which might include periodic larger flow releases, and/or releases after a major sediment producing event in the watershed such as wildfire or landslide activity. High flows are essential to reduce adverse impacts that will occur from sediment deposition, channel narrowing from vegetation encroachment, and reduced biological functioning of the river through Fort Collins.

Although the proposed Augmentation Program is welcome, 10 cfs is not sufficient for its purposes. According to widely accepted instream flow methods such as Colorado Water Conservation Board's R2CROSS approach, 10 cfs is substantially below flow levels required to maintain the environment to a reasonable degree. Dr. Kevin Bestgen, a fisheries expert at CSU, has several years of trout monitoring data collected from the Poudre River in Fort Collins that support at least a 20 to 30 cfs base flow in fall/winter. (Fort Collins' Ecological Response Model (as discussed

in Section 10 of these comments) is informed with this information, and its purpose is to identify probable ecological responses to a range of potential future changing conditions related to streamflows and important secondary factors affecting the river system. It defines clear quantitative targets for low and high flows that are a necessary part of the conversation on mitigation.)

Flushing/bypass flows for mobilizing coarse substrates would reduce the extent of fine sediment deposition and accumulated algae, as well as decrease the likelihood that physical habitat will continue to degrade to a level that produces additional, detectable biological impacts. In the absence of flushing flows, existing physical habitat will be negatively affected in the future as the river channel and its substrate characteristics (e.g., extent of interstices clogged with fine sediment, amount of algae) evolve with ongoing changes in water management.

The Augmentation Program ignores the fact that the above-described response will occur irrespective of base flows because such low flows are incapable of rejuvenating the river bed to maintain habitats required by trout and aquatic insects.

As currently formulated, the Augmentation Program would not avoid or minimize the diversions under the Project which occur during periods of high flows thereby reducing flushing flows. The Augmentation Program would instead maintain certain flows during periods of low flows. It appears that the Augmentation Program was conceived to mitigate and compensate for certain effects of NISP at low flow, and not to avoid and minimize its critical effects on flushing flows.

NEPA requires that the Corps conduct further analyses to address the deficiencies described above, specifically with respect to the ability of the Augmentation Program to maintain the environment with only the maintenance of 10 cfs (at mot times) and no flushing flows. Further, under NEPA and the CWA, the Corps must require measures to minimize the impacts to flushing flows. *See* 40 C.F.R. § 1508.20. *See also* 40 C.F.R. § 230.10. The Corps must require clarification and substantiation of the assertion that the Augmentation Program is avoidance and minimization, as opposed to mitigation.

7.6 NEED TO ADDRESS FLOODING AND STORM WATER ISSUES

SDEIS Appendix F, Section 4.3.1, Stream Channel and Habitat Improvement Plan (AG-01)

Statement: "*Northern Water would provide funding for a stream channel and habitat improvement plan for the Poudre River from the Poudre Valley Canal to its mouth at the South Platte River. The stream channel and habitat improvement plan would address and mitigate Poudre River water related resources, including aquatic, stream morphology, water quality, riparian and special status species. […] NISP commits to spending up to $1.0 million to develop the stream channel habitat and improvement plan. This funding is in addition to other commitment made in this Conceptual Mitigation Plan.*"

SDEIS Appendix F, Appendix A, Table A-1

Statement: "*Item No. AG-03 Implement and fund Poudre River Adaptive Management Program ($5 million + $50,000/yr for 20 years).*"

Comment: Channel contraction and vegetation encroachment from NISP will likely have significant adverse effects on base flood elevations and the resulting extent of flood inundations during large recurrence interval floods such as, the 100- and 500-year flood events. Fort Collins review of the SDEIS indicates a high probability that the capacity of the Poudre River channel to convey floodwater will be materially reduced under the NISP proposed action; therefore, new river modeling, planning and prevention measures will need to be put in place to ensure the safety of the citizens of Fort Collins. Unless addressed at this time, subsequent costs of designing, constructing and maintaining additional flood protection facilities or modifying existing structures would be borne by the citizens of Fort Collins. The mitigation plan states that NISP commits to spending up to $1.0 million to develop the stream channel and habitat improvement plan. As noted above, additional evaluation is needed before approval of the Project in order to better understand possible impacts to the floodplain and determine mitigation alternatives as well as costs and funding for the mitigation.

The District proposes to develop the stream channel habitat and improvement plan. The adequacy of such a plan is speculative at this time because it has not been developed. Because the Corps has not adequately addressed the effects of sedimentation in Fort Collins, the extent of the need for mitigation is uncertain. Further, details of that plan are unknown at this time and the $1.0 million budget's adequacy is arbitrary and capricious without further information. Further, there is no certainty that the any of the recommendations from that plan will be funded and implemented.

With the actual mitigation activities being uncertain, the proposed mitigation activity of funding the "Poudre River Adaptive Management Program" for an amount ranging from $5-6 million ignores the potential need for more significant mitigation actions and caps the amount provided and the time frame for the mitigation program.

In the SDEIS, the Corps must ensure that environmental effects will not be "overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." *Skinner*, 903 F.2d at 1540. As discussed above, NEPA and the CWA require that the Corps provide in the SDEIS additional information on the stream channel habitat and improvement plan. If the Corps approves NISP, it must require as condition of the permit that the District fund any recommendations from the plan and adequate mitigation.

7.7 RESOURCES FOR SECTION 7

- Bledsoe, B. (2015). Technical Memorandum: Northern Integrated Supply Project - Supplemental Draft EIS Flushing Flow Analysis.
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- Espegren, G.D. (1998). Evaluation of the Standards and Methods Used for Quantifying Instream Flows in Colorado. Colorado Water Conservation Board, Denver, CO, November, 47 pp.

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- Nehring, R.B. (1979). Evaluation of Instream Flow Methods and Determination of Water Quantity Needs for Streams in the State of Colorado. Colorado Division of Wildlife, Fort Collins, CO, September, 144 pp.
- Shanahan J.O., D.W. Baker, B.P. Bledsoe, N.L. Poff, D.M. Merritt, K.R. Bestgen, G.T. Auble, B.C. Kondratieff, J.G. Stokes, M. Lorie and J.S. Sanderson (2014) An Ecological Response Model for the Cache la Poudre River through Fort Collins. City of Fort Collins Natural Areas Department, Fort Collins, CO. 93 pp + appendices.
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- Wilcock, P. R., J. Pitlick and Y. Cui (2009) Sediment transport primer: Estimating bed-material transport in gravel-bed rivers. RMRS-GTR-226, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO. 78 pp.

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SECTION 8: AIR QUALITY AND CLIMATE CHANGE COMMENTS

Fort Collins has various concerns related to air quality and climate change impacts and issues in the SDEIS. Climate change is of significant importance to Fort Collins, as noted in Fort Collins Climate Action Plan. *See* http://www.fcgov.com/climateprotection. As discussed in detail below, the SDEIS does not include all sources of air pollution or greenhouse gases ("GHGs") and does not evaluate whether all federal, state, and local air quality regulations and rules will be met as a result of implementation of the Project. The Corps' assessment of the air quality and climate change impacts is not a mere formality. The SDEIS must provide a "full and fair discussion" of those indirect impacts. 40 C.F.R. § 1502.1. This "comprehensive 'hard look' mandated by Congress and required by statute must be timely, and it must be taken objectively and in good faith, not as a exercise in form over substance, and not as a subterfuge designed to rationalize a decision already made." *Metcalf v. Daley*, 214 F.3d 1135, 1142 (9th Cir. 2000). Further, the conformity regulations promulgated pursuant to the Clean Air Act create separate procedural and substantive requirements that the Corps must meet. *See* 40 C.F.R. Part 93 (conformity regulations). However, the SDEIS defers such analysis to an uncertain point in the future.

In violation of NEPA and the Clean Air Act, the SDEIS does not fully analyze these impacts. Because of the Corps' inadequate assessment, the air quality and climate change impacts are understated. Additionally, Fort Collins and other stakeholders cannot fully or meaningfully analyze these impacts and their effects. Revised and additional analyses are required.

8.1 COMMENTS REGARDING INCOMPLETE ANALYSIS RELATED TO AIR QUALITY

8.1.1 No Analysis of Impacts from Increased Traffic

SDEIS Section 3.14.4.1, North Front Range Transportation and Air Quality Planning Council, Page 3-177

> Statement: "*A project must come from a conforming transportation plan and improvement program (40 CFR 93.115) before a conformity determination can be made for it. The design and concept for the proposed project must be adequately defined and must remain consistent with the project's definition in the conforming RTP and TIP. If the project changes in concept or design during the planning process, or if it was not originally included in the RTP and TIP, the regional conformity analysis would need to be revisited before the project can proceed.*"

Comment: The air quality analysis for the realignment of U.S. 287 did not account for the estimated 439,300 annual visitor day increase for recreational use at Glade Reservoir and its long-term impact on vehicle miles travelled ("VMT") in the ozone nonattainment area. It is important that this traffic volume increase be communicated to the North Front Range Metropolitan Planning Organization, the Air Pollution Control Division of the Colorado Department of Public Health and the Environment, the Colorado Department of Transportation, and the Upper Front Range Transportation Planning Region because it will alter the results of the air quality evaluation and the regional ozone conformity analysis.

NFRMPO's conformity analysis depends on a detailed traffic analysis conducted for the entire area covered by the MPO. This includes assigning employment and traffic generators to each of the traffic analysis zones ("TAZs") covered by the model, including the TAZ in which the proposed Glade Reservoir is located. There is no indication in NFRMPO's RTP and conformity analyses for 2035 or 2040 that any of the recreational traffic for the proposed Glade Reservoir has been included. *See e.g.,* NFRMPO, Upper Front Range 2035 Regional Transportation Plan (2008); North Front Range Land Use Allocation Model (June 17, 2015).

The modeling of emissons associated with the recreational VMT should also make adjustments to the vehicle mix to reflect the trucks hauling boats and campers which will increase future air emissions and further impact ozone level predictions. If the assumption is that this represents a shift of visitor days from Horsetooth Reservoir or other reservoir/lakes, then the annual economic benefit from recreation at Glade Reservoir of $13.2 million in SDEIS Section 5.20.2.3.1 needs to be modified. Further, the analysis should also account for increased VMT associated with longer trip lengths to Glade. Per 40 C.F.R. § 93.156(b), the ozone conformity determination must be prepared and made available to the public for review and comment before it is finalized.

The VMT estimates need to be revised to include increased traffic to Glade Reservoir and this information should be transmitted to all appropriate agencies listed above. Fort Collins and other stakeholders must be afforded the opportunity to review and comment on this information. 40 C.F.R. § 93.156(b). A regional ozone conformity determination needs to be conducted only after all air quality impacts from this project have been quantified and included in the conformity determination, and this information must be provided to Fort Collins pursuant to the Clean Air Act.

SDEIS Section 4.13.3.1.1, Glade Reservoir, Page 4-331

Statement: "*Changes in traffic volumes from reservoir construction would be similar to the effects of constructing the Cactus Hill Reservoir described in the No Action Alternative.*"

Comment: The description of construction traffic for the Cactus Hill Reservoir in Section 4.13.2.1 for the No Action Alternative states that construction traffic and heavy vehicles necessary for site development would likely remain on-site for the duration of construction and would not contribute to daily traffic. The construction phase of Glade Reservoir is estimated to be 5 years, and during this time, movement of heavy vehicles for removal of construction and demolition waste would be expected. These activities were not included in the 2013 Air Quality Analysis Memo (GEI 2013) as part of the modeling effort although these emissions will likely contribute to increases in ozone in the nonattainment area.

The Corps must revise or supplement the SDEIS to include additional analyses of the priority pollutants for movement of construction and demolition waste to address the deficiencies described above.

SDEIS Section 4.14.1, Methods, Page 4-337

Statement: "*The realignment of U.S. 287 was included in the STIP for regional ozone conformity determinations by NFRMPO as discussed in Section 3.14.4.1.*"

Comment: The estimated 439,300 annual visitor day increase for recreation at Glade Reservoir and its long-term impact on VMT in the region have not been considered in the conformity analyses for any conforming Regional Transportation Plan (RTP) or the Transportation Improvement Program (TIP) by NFRMPO. As a result, the emissions associated with these vehicle trips must be included in the general conformity analysis.

The RTP and TIP must include increased vehicle traffic and the regional ozone conformity determination by NFRMPO should be revisited due to the absence of this data. Further, the general conformity analysis to be developed by the Corps must include the emissions from these vehicle trips if they have not been modeled in the NFRMPO conformity analysis approved by FHWA.

SDEIS Section 4.14.3.1.1, Glade Reservoir, Page 4-339

Statement: "*The reduced vehicle emissions from a shorter U.S. 287 may be somewhat tempered by steeper grades associated with a portion of the proposed realignment.*"

Comment: The increased traffic associated with recreational use at Glade Reservoir will include trucks, hauling boats, and campers, that when considered in VMT modeling, will increase, not decrease, vehicle emissions. Vehicle emissions would significantly increase resulting from the large VMT increase for recreation; the resulting air quality impacts will include long-term direct and indirect effects; and impact is expected to be at least moderate because the effects would result in clearly detectable change with measurable effects.

The Corps must account for all of the vehicle emissions associated with new recreational trips in its general conformity analysis. The modeling to support this general conformity analysis must include appropriate emissions factors to reflect the vehicle mix associated with boat hauling, campers and other recreational vehicles. Aside from the general conformity analysis, the Corps must disclose the traffic and emissions impacts of this recreational traffic in a revised SDEIS to comply with NEPA.

8.1.2 Analysis Missing Numerous Air Pollution Sources

SDEIS Section 4.14.1, Methods, Page 4-336

Statement: "*Air quality can potentially be affected by short-term direct effects associated with construction of the alternatives (e.g., emissions from construction equipment, workers' vehicles, delivery vehicles, and fugitive dust) or by long-term indirect effects such as changes to transportation (e.g., the realignment of U.S. 287) or from project operations (e.g., emissions associated with pumping).*"

Comment: The SDEIS air quality analysis, including the supporting analysis (2013 GEI), omitted numerous long-term sources of emissions of criteria pollutants and particulates and did not consider any human health or environmental impacts from air toxics. The following significant sources of air emissions were missing from the air quality analysis, such that the analysis underestimates emissions and air quality impacts:

- Criteria pollutant and particulate emissions associated with large VMT increases for recreation at Glade Reservoir.

- Criteria pollutant emissions associated with the new recreational activities at Glade the Corps seeks to claim credit for in its recreational and economic analyses, including boats, jet skis, generators and other sources of non-road mobile source emissions. The emissions of these off-road sources can often be quite high, because they have not been subject to as stringent emissions regulations as on-road vehicles.
- Criteria pollutant emissions associated with pumping during long-term Project operations (e.g., NO_x ozone precursors).
- Air toxics sources:
  - VMT increase for recreation to Glade Reservoir and potential for long-term human health impacts.
  - Construction emissions direct health impacts on local residents.
  - Construction emissions indirect impacts such as deposition of air toxics onto soils and surface waters where they are taken up by plants and ingested by animals and eventually magnified up through the food chain.
- Emissions from vehicle exhaust and fugitive dust emissions from proposed mitigation plan activities such as:
  - Channel and habitat improvements (Appendix F, Section 4.3.2, Page 68).
  - Revegetation efforts to support establishment of native wetland and riparian species on exposed sediment (Appendix F, Section 4.3.4, Page 79).

The Corps must include in a revised or supplement to the SDEIS, as well as its draft and final general conformity analyses, additional quantitative analyses of air quality sources to address the deficiencies described above. The conformity analysis must account for the criteria pollutant emissions identified in the first three bullets above.

SDEIS Section 4.14.1, Methods, Page 4-336

Statement: "*The assessment of predicted effects on air quality is presented in detail in the 2013 Air Quality Analysis Memo (GEI 2013).*"

Comment: The Air Quality Analysis Memo (GEI 2013) presents an incomplete analysis of air quality impacts from NISP for the following reasons:

- The evaluation does not look at the total of all direct and indirect emissions to determine exceedance of the general conformity de minimis thresholds in 40 CFR § 93.153.
  - Only short-term emissions from construction activities were considered for compliance with National Ambient Air Quality Standards ("NAAQS").
- The evaluation of air quality impacts from U.S. 287 realignment does not consider the significant long-term change in VMT expected due to travel to access the new recreation at Glade Reservoir.
- It does not include emissions associated with recreational sources at Glade Reservoir and emissions associated with the electricity necessary for pumping in all alternatives.
- A comprehensive air quality analysis would quantify and evaluate the impacts of additional pollutants beyond the six criteria air pollutants addressed in the SDEIS. The Clean Air Act also regulates hazardous and other air pollutants that can impact human health and the environment.

The Corps must include in a revised or supplement to the SDEIS, and the general conformity analyses, additional evaluations of these air quality impacts to address the deficiencies described above.

SDEIS Section 4.14.6, Unavoidable Adverse Impacts, Page 4-342

Statement: "*During the general conformity process, the CDPHE Air Pollution Control Division (APCD) would review NISP to determine if NISP conformed to the SIP for NO_x. During its conformity analysis, the APCD would determine if the Project's estimated emissions are included in the state's emission inventory.*"

Comment: The analysis of air quality impacts (GEI 2013) did not consider long-term emissions of NO_x, SO2, CO, and particulates associated with the annual electricity requirement of 61,302,050 kWh for pumping for Alternative 2 with no reclamation and 48,135,987 kWh annually for pumping for Alternative 2 with reclamation in determining NAAQS compliance.

Estimated NO_x emissions for pumping would be 74 tons/year for pumping for Alternative 2 with no reclamation and 58 tons/year for pumping for Alternative 2 with the Reclamation Option. These estimates were calculated using the 2014 regional marginal emissions factors and need to be included during the ozone conformity analysis to determine compliance with NAAQS.

Additional analyses of priority pollutants from these vehicle emissions should be completed to address the deficiencies described above.

SDEIS Section 4.14.6, Unavoidable Adverse Impacts, Page 4-342

Statement: "*Unavoidable long-term non-construction related impacts on air quality may occur periodically associated with the exposed shorelines of reservoirs that may cause fugitive dust emissions.*"

Comment: The SDEIS and supporting air quality analysis (GEIS 2013) only estimate fugitive dust emissions from construction activities and do not attempt to estimate fugitive dust emissions from exposed shorelines at Glade Reservoir. NISP hydrologic modeling on Glade Reservoir water levels and is available to estimate frequency and extent of reservoir draw down from which an estimate of fugitive dust emissions can and must be developed. These data are needed to determine the significance of impacts from fugitive dust.

The Corps must include in a revised or supplement to the SDEIS, and its general conformity analysis, additional analyses of priority pollutants from these missions to address the deficiencies described above.

SDEIS Section 5.14.2, District's Preferred Alternative (Alternative 2), Page 5-237

Statement: "*Most direct effects on air quality would occur with the construction of Glade and Galeton Reservoirs and associated facilities and the realignment of U.S. 287.*"

Comment: Long-term direct impacts from NO_x from increased VMT and a shift in vehicle mix resulting from recreation at Glade Reservoir, as well as the emissions from boats, jet skis and other recreational equipment, were not evaluated. Also missing was a quantitative analysis of long-term

direct effects of fugitive dust resulting from low water levels in Glade Reservoir during drought periods, and an analysis of direct impacts from air toxics. These are considered direct effects according to Section 4.1.1.1 Direct and Indirect Effects, of the SDEIS because they occur at the same time and place as the activity and impact a large number of recreational users. The Corps must include in a revised or supplement to the SDEIS additional analyses to address the deficiencies described above.

8.1.3 Inadequate Air Quality Analysis May Lead to Violation of NAAQS For Ozone

SDEIS Section 4.14, Air Quality, Page 4-336

Statement: "*The marginal nonattainment designation does not impose any new planning requirements on Colorado at this time; however, the nonattainment area must meet the standard before 2015 or new requirements may be imposed.*"

Comment: The Environmental Protection Agency ("EPA") lowered the 8-hour ozone standard from 0.084 ppm to 0.075 ppm in 2008. In 2010, EPA reconsidered the 2008 standard and proposed a further tightening of this standard to a range between 0.060-0.070 ppm with several subsequent delays in implementation to date. Regardless of where within the range EPA sets the new ozone standard, meeting it will require unprecedented efforts for Colorado according to the Ozone State Implementation Planning 2010 Progress Report to the Governor. This report also states that ozone State Implementation Plan (SIP) planning is presently the Regional Air Quality Council's highest priority. Stringent requirements from stationary sources, transportation, and other source categories are expected and should be considered likely requirements for implementation of NISP.

The Corps must include in a revised or supplement to the SDEIS a regional ozone conformity analysis taking into account the lowering of ozone standards since the original NAAQS analysis. A lower ozone standard will increase the chances of NAAQS noncompliance.

SDEIS Section 4.14.3.1.1, Glade Reservoir, Page 4-339

Statement: "*NFRMPO determined that a regional ozone conformity analysis was not needed because the new route would be shorter than the existing alignment.*"

Comment: The impact of increased VMT and changes in the vehicle mix from Glade Reservoir recreational users were not included in any regional ozone conformity determination by the North Front Range Metropolitan Planning Organization. Therefore, the realignment of U.S. 287 was not adequately defined. 40 C.F.R. § 93.115 requires the regional conformity analysis to be revisited before the Project can proceed. The regional ozone conformity analysis needs to be revised to include all air pollutant sources.

SDEIS Section 5.14.5, Climate Change, Page 5-238

Statement: "*Given the predictions of increased levels of ground-level ozone in already-polluted areas due to climate change, short-term construction emissions from any of the alternatives could contribute to short-term ozone exceedances when combined with other emissions in the area. This would be a moderate cumulative effect because the effect would be short-term associated with construction and short-term meteorological events.*"

Comment: This analysis did not factor in the long-term increases in VOCs and NO_x associated with increased VMT for recreation at Glade Reservoir, emissions from recreational equipment, and for operational pumping of water. These emissions would occur throughout the life of the Project and thus would be long-term. Frequent exceedances of ozone standards are anticipated when long-term NISP emissions are combined with other regional emissions, higher ozone levels from increased temperatures due to climate change, and expected lowered ozone standards. The cumulative impacts likely qualify as major impacts defined as effects that would be readily apparent with substantial consequences (e.g., frequent ozone exceedances in the nonattainment area).

Further, the conformity rules prohibit even short-term violations or exacerbation of the conformity rules. The Corps will need to demonstrate conformity consistent with the criteria of the general conformity rule. The SDEIS defers this analysis to some unknown point in the future. The regional ozone conformity analysis needs to be revised to include all air pollutant sources.

8.1.4 Determination of Air Quality Impacts and Their Significance Did Not Consider Requirements of All Air Quality Regulations

SDEIS Section 4.14.7, Impact Summary, Page 4-344

Statement: "*During construction, all alternatives would have estimated average annual emissions of NO_x greater than the conformity de minimis level of 100 tons/year for the ozone nonattainment area.*"

Comment: An evaluation of air quality impacts should be based on meeting all regulatory requirements of the Clean Air Act, not just meeting NAAQS. The Corps must consider the following factors to ensure compliance with all federal, state, and local air quality regulations:

1) If the effects would cause an air quality standard to be violated;
2) Activities or emissions that would result in a cumulatively considerable net increase of O_3 in the nonattainment area;
3) Activities that expose sensitive receptors to substantial pollutant concentrations;
4) Fugitive dust emissions from demolition activities that could impair visibility in a Federal Class I area located within 100 km of the proposed activities such as Rocky Mountain National Park (Clean Air Act, Section 169A); and
5) Activities or emissions that would be inconsistent with Colorado's Revised Regional Haze Plan (Colorado Department of Public Health and Environment ("CDPHE") 2011).

The Corps must include in a revised or supplement to the SDEIS additional analyses to address the deficiencies described above. Specifically, the above criteria must be added to the SDEIS for determining air quality impacts and their significance.

SDEIS Section 5.14.2, District's Preferred Alternative (Alternative 2), Page 5-237

Statement: "*The increases in emissions are considered a minor cumulative effect because they would be short-term and the alternative would need to undergo a general conformity analysis that would consider other regional contributions to ensure that the region remains in compliance with NAAQs.*"

Comment: The air quality analysis failed to consider all long-term sources of NO_x emissions (e.g., travel for recreation at Glade Reservoir, recreation at the Reservoir, and operational water pumping). The direct and indirect effects of the short-term and long-term NO_x were therefore not quantified. A comprehensive analysis would likely result in at least moderate effects (e.g., clearly detectable change with measurable effect as defined in Section 4.1.1.3, Intensity and Magnitude of Effect of the SDEIS). Between an insufficient analysis of all emission sources and with the recent tightening of ozone standards, the Corps must require a regional ozone conformity analysis. The Corps must include in a revised or supplement to the SDEIS additional analyses to address the deficiencies described above.

8.2 COMMENTS REGARDING INCOMPLETE ANALYSIS RELATED TO GREENHOUSE GAS EMISSIONS

8.2.1 Analysis Missing Numerous Greenhouse Gas Emission Sources

SDEIS Section 4.14.1, Methods, Page 4-337

Statement: "*The estimated long-term greenhouse gas (carbon dioxide) emissions that could result under each alternative were based on the projected energy requirements for pumping for the alternatives (BBC 2014).*"

Comment: The methods used for estimating greenhouse gas ("GHG") emissions are inadequate for determining NISP GHG increases or impacts for the following reasons:

- All GHGs are referred to as CO_2 emissions. This indicates that additional GHGs with higher global warming potentials such as CH_4, and hydrofluorocarbons ("HFCs") were omitted, and as a result, total GHG emissions are underestimated.
- Significant sources of GHGs from the large VMT increase to and from Glade Reservoir for recreation were omitted.
- The Alternative 2 evaluation must include increases in GHG emissions from boats, jet skis, and other equipment used in the reservoir.
- Increases in emissions associated with waste disposal from recreational users were not included in the analysis.
- There is a requirement for additional wastewater treatment associated with several proposed alternatives that would result in increased emissions of GHGs (CO_2, CH_4, and N_2O) for new and existing wastewater treatment facilities. These have also been omitted from the analysis.

The long-term effects from all the GHG sources that were omitted from this analysis should have been included in the analysis because they can be determined using existing national and international GHG methods and protocols and because they would significantly change the conclusion of the analysis.

The Corps must include in a revised or supplement to the SDEIS additional analyses to address the deficiencies described above. Specifically, the SDEIS must include a more detailed inventory of all GHG sources and a description of methods and calculations is needed to determine GHG impacts.

SDEIS Section 5.14.2.1, Long-Term Emissions of Carbon, Page 5-237

Statement: "*The cumulative effects of the carbon dioxide emissions on climate change are unknown.*"

Comment: The physical link between increasing temperatures and increasing concentrations of GHGs has been documented by a large body of research.[3] The U.S. National Climate Assessment,[4] a report compiled by a team of over 300 experts who collected, evaluated and integrated observations and research on climate change in the U.S., is available to estimate impacts to human health and the environment. Hence, there is no basis for claiming that the cumulative impacts of GHG emissions are unknown. Although a detailed, quantitative evaluation of the cumulative impacts of increased GHG emissions from NISP on the various resources considered in the SDEIS may be premature, the Corps needs to acknowledge the potential for impacts such as increased global temperatures resulting from NISP's GHG emissions. The Corps must include in a revised or supplement to the SDEIS additional analyses to address the deficiencies described above.

SDEIS Section 5.14.6, Impact Summary, Page 5-239

Statement: "*The estimated electrical energy used by the alternatives would be about 0.1% of the energy used in Colorado in 2012 (Section 4.22). This contribution to climate change would be a minor cumulative effect because the effect would be relatively small compared with the regional total annual emissions of GHGs.*"

Comment: The estimation of GHG emissions in the SDEIS only quantifies one source of GHG emissions–from CO2 emissions from electrical energy use for pumping water. This is an incomplete estimate of total GHG emissions for the Project alternatives and leaves out:

- The CO_2, N_2O, CH_4, and HFC emission contributions from increased ground transportation for recreational use at Glade Reservoir;
- Emissions of other GHGs (N_2O) from electricity use for pumping;
- The CO_2, N_2O, and CH4 emissions from disposal of short-term construction and demolition wastes
- The CO_2, N_2O, and CH4 emissions from long-term solid waste disposal from recreational users at Glade Reservoir; and
- The increases in CO_2, N_2O, and CH_4 emissions associated with increased wastewater treatment for several alternatives.

There are numerous national and international protocols (e.g., ICLEI Community Protocol, World Resources Institute (WRI) GHG Protocol, etc.) for estimating GHG emissions from multiple emission sources. Furthermore, it is not valid to compare electrical energy use for pumping for NISP to that of the electricity use of the entire state of Colorado during 2012 and then extrapolate impact on climate change based on this comparison. There are local and regional differences in the

[3] 2007. IPCC WGI Fourth Report: Climate Change 2007: The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for Policymakers, http://www.offnews.info/downloads/SPM2feb07.pdf.

[4] Mellilo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment.* U.S. Global Change Research Program, 841 pp. doi:10.7930/JoZ31WJ2.

GHG emissions from electricity depending on if the source is clean (e.g., renewable energy). There is a state-level GHG emissions estimate (not provided in the SDEIS), but there is no known "regional total annual emissions of GHGs." This determination of a minor cumulative effect is not based on valid or transparent data.

The Corps must include in a revised or supplement to the SDEIS an analysis of the total GHG emissions that includes all major GHG sources and uses valid comparisons. Additionally, the Corps must provide an adequate factual basis for its determination of minor cumulative effect. The Corps cannot rely on "conclusory assertions that an activity will have only an insignificant impact on the environment." *Ocean Advocates v. U.S. Army Corps of Eng'rs*, 402 F.3d 846, 864 (9th Cir. 2004).

8.2.2 Claimed Minor Impacts on Greenhouse Gas Emissions

SDEIS Section 4.14.7, Impact Summary, Table 4-96. Impacts to air quality, Column Predicted Annual Carbon Dioxide Emissions for Project Operation at Full Utilization, Page 4-343

Statement: "*Alternative 2 Reclamation Action Option: Construction over an estimated 9.1 years would have a short-term minor impact on air quality.*"

Comment: Annual carbon dioxide emissions for Project operation at full utilization of 37,259 metric tons for Alternative 2 with Reclamation Action Option do not constitute a minor impact on air quality from a climate change perspective. Moderate effects are defined in Section 4.1.1.3 Intensity and Magnitude of Effect in the SDEIS as effects that would result in clearly detectable change with measurable effects. This amount represents 70% of the 2014 GHG emissions from Fort Collins' entire municipal operations (2014 Comparative Municipal GHG Report) and 80% of the 2013 GHG emissions from Colorado State University (one of the 3 top GHG sources within Fort Collins city limits (see reporting via EPA map located at: http://www.epa.gov/ghgreporting/). For comparison, under the EPA's Mandatory GHG Reporting Rules, this level of emissions constitutes a major source. The Corps' characterization of these emissions as "minor" when the EPA characterizes lower levels to be "major" is arbitrary and capricious. The Corps must include in a supplement to the SDEIS additional analyses to address the deficiencies described above.

8.3 CUMULATIVE EFFECTS

SDEIS Section 5.14.6, Impact Summary, Table 5-54, Page 240

Statement: "*When combined with RFFAs and climate change, construction would have a short-term minor impact on air quality. Exposed reservoir shorelines could periodically contribute to local fugitive dust. Operations would contribute to the increase in the regional emissions of carbon dioxide. The cumulative effects on air quality would be minor because the incremental increase in carbon dioxide emissions would be relatively minor compared with the regional total annual emissions of GHGs.*"

Comment: This summary is missing a comprehensive evaluation of the cumulative impacts of criteria air pollutants, air toxics, particulates, and all the relevant greenhouse gases over the lifetime of the Project. It fails to consider the residence time of any of these pollutants in the atmosphere and the full range of impacts on human health and the environment. This section and table is missing

numerous emission sources detailed in other comments by Fort Collins. The incomplete assessment is not adequate to make a determination of air quality. A more comprehensive set of air quality criteria should also be evaluated to determine the significance of impacts. Additionally, it is not valid to compare a partial Project GHG emissions inventory to a "regional total annual emissions of GHGs" that does not exist nor is referenced in the document. The Corps must include in a revised or supplement to the SDEIS additional analyses to address the deficiencies described above.

8.4 FUGITIVE DUST EMISSION CONTROL PLAN AND ADDITIONAL MITIGATION MEASURES FOR VEHICLE EMISSIONS

SDEIS Appendix F, Section 3.3.4, Air Quality (AQ-01), Page 50

Statement: "*To minimize and control fugitive dust, Northern Water would develop and implement fugitive particulate emission control plan that identifies specific steps that would be taken to minimize fugitive dust generation.*"

Comment: Additional mitigation measures must be implemented to control criteria and other air pollutants including:

- The fugitive particulate emission control plan should incorporate the following to the maximum extent feasible:
  - All haul roads would be covered in gravel with minimal silt content.
  - High winds restrictions to involve no earthmoving activities performed when local winds speeds exceed 30 miles per hour.
  - Implement engineering controls to prevent off-property transport.
  - Reduce vehicle speeds by establishing a maximum speed limit or install traffic calming devices to reduce speeds to a rate that prevents off-property transport of dust entrained by vehicles.
  - Unload truck beds and loader or excavator buckets slowly and at the lowest height possible.
  - Dust control measures should be incorporated to the maximum extent feasible during blasting operations. The following measures should be used during blasting activities:
  - Conduct blasting on calm days to the extent feasible. Wind direction with respect to nearby residences and sensitive environmental receptors should be considered.
  - Design blast stemmings to minimize dust and to control fly rock.
  - Install wind fence for control of windblown dust.
- If one or more of the suggested air quality significance criteria are met (proposed by the Fort Collins in the Comment to SDEIS Section 4.14.7 Impact Summary, Page 4-344), the following mitigation measures for mobile sources should be implemented:
  - Any off-road construction equipment (e.g., loaders, excavators, etc.) must be equipped with engines that meet the model year (MY) 2015 emission standards for off-road compression-ignition (diesel) engines. Older model year engines may also be used if they are retrofit with control devices to reduce emissions to the applicable emission standards.
  - Any on-road construction equipment (e.g., pick-up trucks at the construction sites) must be equipped with engines that meet the MY 2000 or on-road emission standards.
  - Any trucks used to transport materials to or from the construction sites must be equipped with engines that meet the MY 2010 or later emission standards for on-road heavy-duty

engines and vehicles. Older model engines may also be used if they are retrofit with control devices to reduce emissions to the applicable emission standards.

Implementation of these various engine control measures would substantially reduce NO_x and PM_{10} emissions; however, the extent of the reduction would vary based on the size (horsepower), age, and type of equipment. Controlling emissions from equipment operating on the construction site, including both off-road construction equipment and on-road pick-up trucks could reduce NO_x and PM_{10} emissions by over 80%. Controlling emissions from on-road heavy-duty diesel trucks could also reduce NO_x emissions by approximately 20% or more.

8.5 RESOURCES FOR SECTION 8

- CDPHE, 2014. Colorado Greenhouse Gas Inventory – 2014 Update Including Projections to 2020 & 2030.
- City of Fort Collins, 2014 Comparative Municipal GHG Report.
- Fort Collins Climate Action Plan, dated 2008.
- Fort Collins Climate Action Plan: Framework, dated 2015.
- Fort Collins Climate Action, dated 2014.
- ICLEI, 2013. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, V 1.1.
- IPCC, 2007. Climate Change 2007: The Physical Science Basis, Summary for Policymakers, International Panel on Climate Change, Geneva, Switzerland, p. 2-18.
- Mellilo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: *Climate Change Impacts in the United States: The Third National Climate Assessment.* U.S. Global Change Research Program, 841 pp. doi:10.7930/JoZ31WJ2.
- Resolution 2015-030.
- WRI, Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), An Accounting and Reporting Standard for Cities.

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SECTION 9: RECREATION AND AESTHETICS COMMENTS

The Poudre River is a major recreational attraction in Fort Collins, attracting approximately over 500,000 visitor days a year. (SDEIS at page 3-195). These visitors' fish, hike, bicycle, boat, picnic, and view wildlife. The fishing is so good in the downtown reach of the river that creel counts for Segment B are consistently higher than any other reach on the Poudre River, including the canyon reach (personal communication, Kurt Davies, former Colorado Parks and Wildlife Poudre River fisheries biologist). Over many decades, Fort Collins has spent tens of millions of dollars beautifying, acquiring land, building recreation amenities, and restoration natural habitat. (City of Fort Collins Natural Areas Master Plan and Cache la Poudre River Natural Areas Management Plan Update). Fort Collins owns three parks on the River and over 1,800 acres of natural areas. In 2014, City Council adopted a Downtown Poudre River Master Plan that describes a vision for continuing to improve the most heavily visited reach of the River from Shields Street to Mulberry. This Master Plan describes a proposed whitewater park just below the College Avenue Bridge. The park includes storm water and habitat improvements and is estimated to cost approximately $8.5 million of which $7 million have been secured to date.

9.1 IMPACTS TO BOATING

SDEIS Section 4.16.3.3, Segment B

Statement: "*Segment B is popular for boating (canoeing and kayaking) and is the location of a proposed whitewater park. Target flows for quality boating opportunities are at or above 150 cfs. Compared with Current Conditions, Alternative 2 would result in an average reduction of 3 to 7 boating days per month (a total of 19 fewer days over the May-August period), resulting in a moderate to major adverse effect on boating opportunities in Segment B. Augmented winter flows in Alternative 2 would result in minor beneficial effects on recreational fishing opportunities in Segment B…*"

SDEIS Section 4.16.6, Unavoidable Adverse Impacts

Statement: "*Flow changes in Alternatives 2 and 3 would adversely affect boating and fishing opportunities along the Poudre River through Fort Collins (Segment B).*"

SDEIS Section 4.16.1

Statement: "*The 150 cfs threshold was based on comments on the DEIS from a local boating group on the minimum flows that would be needed to allow reasonable passage by canoe through Fort Collins; a 100 cfs threshold was previously used in the DEIS.*"

SDEIS Appendix F, Section 2.2.1, Summary of Effects

Statement: "*Reduced streamflow during the summer would result in a minor to moderate adverse effect on river-based boating in Segment B…*"

Comment: The SDEIS notes in Section 4 that there will be moderate to major adverse effect on boating opportunities in Segment B associated with Alternative 2. However, in Appendix F, that effect is inconsistently characterized as "minor to moderate." The inconsistency reveals a lack of the meaningful analysis required by NEPA.

Fort Collins does not agree with the characterization of boating impacts to Segment B as only minor or moderate. With boating days reduced by one-third on average, clearly this is a major effect, as described by the SDEIS's own terms. (See page 4-351 "Major effects would result in readily apparent effects with substantial consequences").

Paragraph 4.16.3.3 is unclear as to how many days at 150 cfs will be reduced. The SDEIS states that "Alternative 2 would result in an average reduction of 3 to 7 boating days per month." If this sentence is referring to all months it could be read to mean the loss of 36 to 84 days a year.

The SDEIS describes 150 cfs in Segment B as the minimum flows necessary for "reasonable" passage by canoe. Canoeing at 150 cfs is possible but that is the low end of the threshold (personal communications with local boaters). Between 75 and 100 cfs, the Poudre River through Fort Collins is just passable by inner tubes. The SDEIS should more definitively describe what "reasonable" means with respect to boating in Segment B.

The SDEIS notes minor beneficial effects to fishing due to winter time augmented flows in Segment B, although in a subsequent paragraph (see SDEIS Sections 4.16.3.3 and 4.16.6 respectively) it inconsistently notes that Alternative 2 would adversely affect fishing. However, as noted elsewhere in these comments, the SDEIS has failed to adequately analyze impacts to aquatic biological resources. Therefore, it is not yet possible to accurately characterize the impacts to fishing.

The Corps must include in a revised or supplement to the SDEIS an adequate analysis of the impacts on boating opportunities in Fort Collins, as described above. Further, the Corps must provide factual bases for its conclusions.

9.2 IMPACTS TO RECREATIONAL EXPERIENCES

SDEIS Section 4.16.3.3, Poudre River

Statement: "*Under Alternative 2, changes in streamflows are not expected to result in discernable visual impacts on recreational experiences along the Poudre River, or the availability of land-based recreational activities such as trail use, wildlife viewing, and photography. Likewise, wildlife-related recreation along the mainstem…would be unaffected*"

Comment: As noted elsewhere in these comments, Fort Collins has extensive concerns with the analyses of impacts to riparian and wetland vegetation. Moreover, Fort Collins asserts that the impacts will be greater than those described by the SDEIS, as described above. Over time, it follows that the degradation to the environmental resources of the river are likely to result in degradation to the user experience beyond a negligible or minor impact.

The SDEIS appears to conclude that there will be little to no impact to recreation activities (other than boating) along the Poudre in Fort Collins (SDEIS Table 4-100, page 4-360). However, based on a study commissioned by Fort Collins in 2008 ("Estimating Benefits of Maintaining Peak Instream Flows", Dr. John Loomis) a reduction in peak flow of 50% would reduce visitation to the river by approximately 33%.

The SDEIS describes a very large range of financial value associated with visits to the Poudre River Trail and visits to Natural Areas along the river. Figures for visits to Natural Areas range from approximately $2 million to approximately $14 million annually (SDEIS 3-196). Thus, the median value is $8 million. At approximately 500,000 visitors a year, that works out to $16 per visitor. Although it is not known precisely how many visitors are present in Natural Areas during May, June and July a safe assumption is that at least one-quarter of total annual visitors (approximately 125,000) are present during these months. Thus, a reduction of 33% of these visitors (approximately 42,000) at $16 a visit would represent an approximately $670,000 annual loss. While these figures may contain a margin of error, they are conservative and likely underestimate impacts, and suggest that there would be tangible economic losses related to flow depletions.

The Corps must include in a revised or supplement to the SDEIS additional analyses of the impacts on recreational experiences. Additionally, the Corps must explain its determination in the face of the contradictory evidence offered by Fort Collins. The Corps fails to comply with NEPA if it "offers an explanation which runs counter to the evidence . . . ." *Sierra Club v. U.S. Army Corps of Eng'rs*, 295 F.3d 1209, 1216 (11th Cir. 2002).

9.3 AESTHETIC IMPACTS

SDEIS Section: 4.18.3.3 Poudre River, Pages 4-373 to 374

Statement: "*Alternative 2 is predicted to have weekly average river stage declines of 0.5 foot or greater during the May through September period for 19% of the period of record. The increased frequency of predicted reductions in stage greater than 0.5 feet (almost twice as frequent as the other segments) in a segment of the river that is highly used, would likely be noticeable to many viewers familiar with the river in this segment ....*"

Comment: The SDEIS needs to provide a better assessment of the impacts of NISP on the visual resources of the Poudre River (specifically within Fort Collins), including the river channel, and wetland and riparian vegetation, based on the acknowledged reduced flow levels. However, the Corps must describe specifically how the aesthetics could change, such as the reduction of diversity and density of vegetative cover, reduction of wildlife, exposure of rip-rap and man-made structures and other factors due to the reduction of river flows. Data must be developed. For example, photo simulations and surveys could be conducted to evaluate the public's perception of lower river flows and the effects this could have on the visitor's experience and future urban and recreational development along the river corridor. Under NEPA, the Corps must require additional mitigation measures to address the deficiencies described above.

9.4 MITIGATION OF VISUAL IMPACTS

SDEIS Appendix F, Section 2 Mitigation Goals and Objectives, Page 16

Statement: "*This section provides an overview of effects for the key environmental resources affected by NISP, and a summary of mitigation approaches that were identified by Northern Water.*"

Comment: In violation of NEPA, the Corps has "failed entirely to consider an important aspect of the problem." *State Farm*, 463 U.S. at 43. The Corps cannot ignore visual impacts of the proposed action. Thus, the Corps must include in a revised or supplement to the SDEIS additional analyses of visual impacts and provide adequate mitigation measures to address the deficiencies described above.

9.5 AUGMENTATION PROGRAM AND MITIGATION

SDEIS Section 4.16.6, Unavoidable Adverse Impacts

Statement: "*The District's proposed mitigation will be reviewed by the Corps to determine whether unavoidable adverse impacts would remain with the implementation of the District's proposed mitigation.*"

SDEIS Appendix F, Section 2.1.2, Mitigation Approach

Statement: "*Glade Reservoir provides an opportunity for low-flow aquatic resources mitigation. […] Modification of diversion structures to allow fish migration and enhance channel characteristics would…benefit aquatic resources….*"

Comment: Fort Collins supports efforts to enhance winter base flows, which may provide a minor benefit to the fishery in Segment B. Based on the Poudre River Ecosystem Response Model, 20 to 30 cfs is an optimal base-flow regime for the sport fishery. (As noted elsewhere in these comments, it is not clear that Northern will be able to deliver the proposed augmentation flows due to water rights issues.)

Fort Collins supports efforts to modify intervening diversion structures to improve habitat characteristics. As noted elsewhere in these comments, the Conceptual Mitigation Plan proposes improvements to three structures to bypass flows. There are, however, a number of other structures that lack the infrastructure to bypass flows (See Operational Comments regarding SDEIS Section 7.3.5).

As noted elsewhere in these comments, Fort Collins has concluded that flushing flows of 2,500 to 3,500 cfs increase the likelihood that "multiple factors supporting reproduction of both trout and aquatic insects are…maintained over decadal and longer time scales." (See Fort Collins comments in Section 7 of these comments and the Poudre River Ecosystem Response Model). SDEIS Appendix F, however, does not include any flushing flows.

In general, the SDEIS does not establish that the current mitigation plan will adequately address the negative Poudre River recreation impacts; particularly those impacts to recreation caused by reduced peak flows. Fort Collins has concluded that it will not, based on the data presented. Furthermore, flat water recreation or other forms of recreation located at Glade Reservoir do not compensate for the loss of water-based recreation in Fort Collins because such flat water recreation is of a different nature than recreation on a dynamic, healthy river.

It is also unclear how the Corps derived the flatwater visitation values for the Glade Reservoir and whether these add to visitor numbers that would have already existed elsewhere or

simply shift visitation between lakes. If the latter, it is inappropriate to claim any net recreational or economic benefits.

The SDEIS must include avoidance, minimization, and mitigation measures that address flushing flows. The Corps must also require compensatory mitigation for the major loss of boating days on Segment B.

9.6 RESOURCES FOR SECTION 9

- Cache la Poudre River Natural Areas Management Plan Update, June 2011
- City of Fort Collins Ecosystem Response Model.
- City of Fort Collins Natural Areas Master Plan, October 7, 2014.
- City Plan, Fort Collins, February 15, 2011.
- Downtown River Corridor Implementation Program, July 18, 2000.
- Fort Collins Natural Areas Map, October 2014
- Poudre River Downtown Master Plan, October 2014.
- Estimating the Economic Benefits of Maintaining Peak Instream Flows in the Poudre River Through Fort Collins, Dr. John Loomis, April 2008

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SECTION 10: BIOLOGICAL RESOURCES COMMENTS

Fort Collins has invested substantially in the Poudre River corridor through town, and thereby in its biological resources, which includes aquatics and fisheries, wetlands and riparian areas (including their ground water aspects), and wildlife. Fort Collins (including through its Natural Areas and Parks Departments and Stormwater Utility) owns and manages nearly 75% of the floodplain in town as undeveloped lands. The trout populations within Fort Collins are as high as some of the most productive areas for the river. *See* Fish Survey, Colorado Parks and Wildlife, Cache La Poudre Fish Survey and Management Information. These investments provide extensive recreation and educational opportunities, conservation of natural habitats and species, flood attenuation, pollutant filtration and serve as catchments for urban stormwater catchments (City of Fort Collins, 2011). A degradation of these resources, a likely outcome of NISP, would substantially and negatively affect these valued investments and assets. The SDEIS's analyses of wetlands and riparian areas raise various concerns as discussed in detail in the following subsections.

10.1 THE POUDRE RIVER IS NOT ON AN INEVITABLE DOWNWARD TRAJECTORY AS CLAIMED IN THE SDEIS, AND THE ECOLOGICAL RESPONSE MODEL AND RIVER HEALTH ASSESSMENT FRAMEWORK CAN BE USED AS TOOLS

Comment: Fort Collins has conducted various studies on the Poudre River designed to increase the understanding of current and potential future conditions. As the owner of water, wastewater, and stormwater utilities, Fort Collins is constantly conducting studies related to the functions of these enterprises. As a landowner, municipality, and steward of the land and water for current and future residents, Fort Collins has also sought to better understand the Poudre River beyond the scope of these vital utilities through conducting studies on other aspects of the river. Several of those studies are identified in and provided with these comments. In particular, studies have been designed to further understand site specific issues (such as land use in the floodplain), drivers (such as inundation of the riparian zone) and thresholds (such as sediment mobility flow thresholds) that influence the condition of ecological components and also to understand the system as an integrated sum of its parts.

The future of the Poudre River is of interest to Fort Collins not only for the intrinsic value of a healthy ecosystem, but also for the role a healthy ecosystem plays in the provision of other watershed services such as high quality drinking water, wildlife habitat, the basis of the aquatic ecosystem, recreation opportunities, and protection of public safety and infrastructure, all of which contribute to a healthy Fort Collins economy and livelihood. The condition of these watershed services has a direct financial impact on the City, as well as deeper impacts that are less easily quantified, though no less valuable.

The SDEIS inaccurately describes the Poudre River as having an ecosystem that has already passed a biological threshold and that is on a boundlessly declining trajectory. The SDEIS concludes that important ecological processes such as sediment mobility and support of riparian functions are not currently occurring and therefore additional reductions are "*predicted to reinforce or accelerate the well-established trajectory*" (SDEIS Section 4.9.9 Table 4-69) (emphasis added). Based on this proposition, the SDEIS concludes that any negative impacts from the proposed actions of NISP are minor or imperceptible, and not significant when considered against this supposed inevitable trajectory towards an impoverished system. However, neither NEPA nor the CWA allow agencies to disregard the impacts of proposed actions by assuming that environmental resources will be lost regardless.

Fort Collins disagrees with the notion espoused in the SDEIS that the Poudre River is on a trajectory of inevitable decline. Although many changes have occurred to the Poudre River over the past 150 years since the early days of water development, Fort Collins' perspective, supported by numerous observations and data, is that today's ecosystem still retains many functional elements that are key building blocks of a resilient and healthy system that continues to provide valued services. Moreover, as discussed in this Section 10, Fort Collins believes that a series of flawed analyses in the SDEIS underestimates the impacts of NISP, mischaracterizes the trajectory, and omits an evaluation of the aggregate impacts of the Project. As a consequence, the SDEIS incorrectly concludes that there will be minor or negligible impacts to the biological and watershed services and resources associated with the river.

The following reports and supporting analyses are submitted as evidence further substantiating the concern that the SDEIS mischaracterizes the trajectory.

The **Ecosystem Response Model** ("ERM") is a probability-based integrative ecosystem model developed to show likely changes and trends across various flow scenarios. The original report was produced in 2014 and provides the full project description http://www.fcgov.com/naturalareas/eco-response.php. With the release of the SDEIS and CTP hydrology, the ERM was rerun. New results are provided in the ERM Supplemental Report (City of Fort Collins, 2015). In preparing this work Fort Collins does not intend the ERM or its results to supplant the various in-depth studies undertaken as part of the SDEIS. Nevertheless, results of the ERM provide a meaningful holistic evaluation of the Poudre River ecosystem, an ecosystem which, contrary to conclusions made from various individualized studies in the SDEIS, maintains many key ecologic functions.

The **River Health Assessment Framework** ("Framework") was developed as a tool to clearly define the Fort Collins' vision of a healthy and resilient river through recommended ranges for system metrics (http://www.fcgov.com/naturalareas/riverhealth.php). As with the ERM, the Framework is not intended to supplant the various in-depth studies undertaken as part of the SDEIS. The Framework also sets forth a methodology for assessing and communicating about river conditions and functions. The Framework uses a scholastic A through F grading scale to grade different metrics, which represent various components of the river system. Grades of B and above signify a resilient component of the system. Grades of C identify at risk components, while grades of D and below represent impaired or vulnerable components. The closer any single metric gets to the C- to D+ threshold, the more at-risk it becomes.

Though each component receives a separate grade, these components work synergistically to support a more robust, functional ecosystem with greater resilience to future disturbances, stochastic events, and short-term or localized human-caused impacts. In other words, each metric contributes to an overall system that has good function, or conversely may be at greater risk. Therefore, a grade of a B or an A for one metric supports other metrics. Conversely, a grade of D or F would indicate impairment or imminent vulnerability which may have broad implications for whole system

Even though current conditions have not been fully assessed using this tool, much is known for various metrics through existing datasets and extensive working knowledge of the river. Preliminary evaluations indicate that current conditions generally range from grades of B to C, with a few metrics falling below a C. Given the expected response of the Poudre River to a decline in flows, and if flows are reduced by NISP as indicated in the SDEIS and discussed herein, a number of the metrics are expected to trend downward from their current condition. (Please see the Framework report for the best understanding of current conditions by river segment).

A few important themes emerge from the ERM and the Framework. The Poudre River will show a response to declines in peak flows in particular. Current flows still meet key sediment mobility thresholds which positively influence all aquatic life dependent on clean riverbeds. The preferred alternative decreases the return interval for these flows and will negatively affect overall channel structure, critical aquatic habitat and maintenance of channel capacity. The extent of all

riparian habitat types and ecological processes is directly correlated to peak flows. A measureable narrowing will occur across the riparian landscape.

The SDEIS must not consider the Poudre River as being on an inevitable downward trajectory, as discussed in this Section 10. *See State Farm*, 463 U.S. at 43 (explanation is not "satisfactory" if the "explanation for its decision . . . runs counter to the evidence before" the agency.). Fort Collins has identified that NISP poses significant challenges to the future condition of the Poudre River, with these concerns based, in part, on the ERM and the Framework. These tools also describe various opportunities for maintaining and improving the functions and processes that underpin the Poudre River's biological and healthy conditions. Thus, the ERM and the Framework can serve as effective guideposts and decision support tools as NISP and other consumptive projects are proposed and evaluated in the Poudre River basin.

10.2 COMMENTS REGARDING COTTONWOOD ESTABLISHMENT

10.2.1 Incorrect Assumption that Cottonwood Forests Are in Decline

SDEIS Summary S.6.4.2, Page S-32

Statement: "*flows that are no longer effective in establishing new stands of plains cottonwood*"

SDIES Summary S.7.6, Page S-45

Statement: "*The plains cottonwood woodlands along the Poudre River are on a trajectory of decline. Nonnative woody vegetation (e.g., green ash, Russian olive, and Siberian elm) are predicted to increase as a result of the current trajectory*."

Comment: The summary for the analysis (Table 4-69) frequently relies on an assertion that the downward trajectory of cottonwood woodlands along the Poudre River will continue with or without Alternative 2. This argument has not been substantiated and directly contrasts evidence from Fort Collins' restoration successes and research projects (Shanahan, 2014, City of Fort Collins, 2015a, City of Fort Collins, 2015b). Moreover, the impacts identified in the SDEIS need to be quantified and not just described qualitatively. A direct response of narrowing (and reduction in the probability for cottonwood recruitment leading to age class distributions skewed toward older forests) is expected when peak flows are chronically reduced as well as a parallel reduction in the probability for cottonwood establishment (Nilsson and Svedmark, 2002). A data-based impacts analysis is possible through spatial comparison of flow events likely to support various ecological processes and habitat types.

Furthermore, it is in the City's interests to work towards restoring the system that supports the keystone native woody species. Forests dominated by native species, as compared to non-native species, are more adapted and therefore more resilient to natural disturbances on this type of system. A particularly unique situation may occur on the Poudre if we accept the premise that green ash will dominate the riparian forests (as described herein). With the arrival of the emerald ash borer to Colorado, the forests along the Poudre River are likely see a significant loss or degradation due to die off the ash (http://www.ext.colostate.edu/pubs/insect/eab_threat_urbanforests.pdf).

Rather than assume that the future decline of cottonwoods is inevitable, the impetus for Fort Collins' research and management has been to better understand the most effective actions for supporting self-sustaining cottonwood populations. Restoration efforts focused on topographical changes have proven highly productive for cottonwood establishment, as discussed in this Section 10. *See State Farm*, 463 U.S. at 43 (explanation is not "satisfactory" if the "explanation for its decision . . . runs counter to the evidence before" the agency.). In particular, the Fort Collins Natural Areas Department staff has found that when excessive shading and steep banks are restored, moderate flood events readily leads to extensive cottonwood recruitment. Hence, these types of efforts and observations made by Fort Collins contradict the SDEIS assertion of a baseline downward trajectory of cottonwood woodlands, indicating an incomplete disclosure of the baseline conditions in the SDEIS.

The analysis must be revised to include a quantitative (and spatial) analysis of the effects of all NISP alternatives on cottonwoods, and consider the role of floodplain topography as well as flows.

10.2.2 Inappropriate Analysis Based on Future Conditions

Wetlands and Riparian Resources Effects Report for the Mainstem of the Cache la Poudre River ("Resources Report"), Section 4.1.1, Trajectory for inundation of Riparian and Wetland Resources, Page 16

Statement: "*Part of the historical and future trajectory for the riparian and wetland resources of the Mainstem includes a continuation of the trend of less frequent inundation of wetland and riparian resources along the Mainstem.*"

SDEIS Section 4.9.1.1, Resource Trajectory, Page 4-212

Statement: "*the trajectory of the wetland and riparian resources along the mainstem has been affected by historical and contemporary physical and hydrologic changes that have established a trajectory that is expected to continue under Current Conditions hydrology […] wetland and riparian plant communities along the mainstem will likely gradually shift to plant communities with species adapted to a drier environment and less tolerant of or dependent on flooding or shallow ground water levels…*"

Comment: The characterization of the trajectory of the riparian resource and phrase "trend of less frequent inundation" seems to indicate there will be ongoing hydrologic changes. Whereas other portions of the SDEIS perform analyses based on the current hydrologic conditions, the analysis of the riparian resource seems to be based on assumed future conditions, which are presumed to be worse than current conditions. This is not appropriate and downplays the effects of NISP. The analysis must be revised to base riparian analyses on current hydrologic conditions and not presumed future conditions.

10.2.3 Incorrect Conclusion That Current Flows Are the Primary Limitation

SDEIS Section 4.9.1.1, Resource Trajectory, Page 4-212

Statement: **"***The combination of flood flows that are no longer effective in establishing new stands of plains cottonwood, extensive stands of smooth brome and reed canarygrass that compete with cottonwood seedlings and nonnative woody vegetation that is establishing at rates equal to or greater than plains cottonwood,*

establish a trajectory for a future Poudre River riparian corridor that will likely be very different from the past and current riparian corridor."

Comment: As noted in comments below on the Resources Report, the primary cause for compositional changes to the riparian forest lies in physical constrictions of the river, banks, and floodplain. Nowhere in the SDEIS or supporting documents do data or ecologically-based logic demonstrate that current flows are a limitation. In contrast, as noted elsewhere in these comments, moderate flow events (such as the 5 year flow) can and do support cottonwood recruitment. *See State Farm*, 463 U.S. at 43. Further, intense, high flows cause mortality (through scour and burial) of brome and reed canarygrass in some years.

Furthermore, while this transition may be occurring on the landscape, it is arbitrary and incorrect to detach changes in flows due to NISP from this trajectory. The body of research on riparian ecology consistently relates flow regimes with trends in cottonwood populations. Flooding plays an essential role in the recruitment of cottonwood and a reduction in flooding invariably negatively affects cottonwood recruitment. Such will be the impacts from NISP and those impacts must be identified and analyzed. The analysis should be revised to reflect the impacts described above.

10.2.4 Incorrect Conclusions Regarding the Crossing of a Biologic Threshold

SDEIS Section 4.9.8, Unavoidable Adverse Impacts, Page 4-250

Statement: "*The 2012 Wetlands and Riparian Resources Baseline Report concluded that the mainstem had crossed a biologic threshold that limits the recruitment of plains cottonwood and is in the process of altering the composition of the riparian woodlands.*"

Comment: The data presented in the Resources Report does not support this conclusion, as discussed further below. In fact, the word "threshold" does not appear in the Resources Report. The analysis should be revised to remove references to a biologic threshold.

10.2.5 Incorrect Conclusions Regarding Green Ash

Resources Report, Section 5.3.1, Vegetation Trends, Nonnative Species, Page 26

Statement: "*Table 4. Ranking of Nonnative Species at each Poudre River Riparian Vegetation Study Site.*"

Comment: In the above-referenced table, the green ash species is recorded as a "4," being infrequently observed the lowest category for all six study sites. This data contradicts the oft-repeated conclusion throughout the SDEIS on the trajectory of this resource that the green ash species is likely going to replace cottonwoods and become the dominant species. By contrast, Table 5 (page 28) of the Resources Report reports young green ash (<2 dbh) receiving a ranking of #1 for Watson Lake and Martinez Park. The SDEIS Section 4.9.1, page, 4-212 suggests the upper two sites will continue to be dominated by narrowleaf cottonwood. These findings and inconsistent conclusions must be corrected.

10.2.6 Incorrect Conclusions Regarding Cottonwood Recruitment

Resources Report, Section 5.3.3 Size Class Distribution of Woody Vegetation, Page 29

Statement: "*Only three species, box elder, narrowleaf cottonwood, and plains cottonwood, were recorded in the two largest size classes that included individuals greater than 18 inches dbh. … At Martinez Park, although green ash occurred with the highest frequency, most of the individuals occurred in the smallest size class. … The Archery site had the fewest number of individuals compared to the other five sites. … Green ash was rarely recorded at the Archery site….*"

Comment: This discussion from the SDEIS is linked to the data in Table 6 (page 30) which shows, as the discussion suggests, only cottonwood, boxelder and crack willow species occur in the largest size classes. The data clearly shows that only cottonwoods demonstrate an inverse J-curve distribution of size classes. This type of distribution indicates ongoing recruitment and survival for cottonwoods. The issue with cottonwoods is that in these sites they are not demonstrating large recruitment events, but they are demonstrating continued modest recruitment.

The lack of older/larger green ash may indicate a transition is just beginning whereby green ash will become more dominant but it also may indicate green ash is not surviving past smaller/younger age classes. Ignoring this underlying uncertainty has led to incorrect conclusions**.** The analysis must be revised to properly analyze and acknowledge ongoing recruitment and survival for cottonwoods.

10.2.7 Inaccuracies Regarding Cottonwood Recruitment and Moderate Flow Events

Resources Report, Section 5.8.1, Establishment of Plains Cottonwood, Page 50

Statement: "*Cottonwood seedling recruitment is episodic and relatively rare even along free-flowing streams (Mahoney and Rood 1998)…. If river stages decline too rapidly, drought stress produces substantial seedling mortality (Scott et al. 1993). Along meandering rivers, successful establishment is characteristically associated with medium to large floods. Researchers have also determined that it is moderate and large flood events that directly enable cottonwood recruitment, whereas smaller flood events are often insufficient for cottonwood replenishment.*"

Comment: The use of the term "moderate flood event" is inconsistent and ill-defined throughout the report. It is used in Section 4.2.2 of the 2014 Technical Report (Riparian Effect) as follows: "the moderate flows of 580 to 1900 cfs do not currently inundate riparian and wetland areas with enough frequency to support or renew riparian areas and at most sites NISP will not substantially reduce the frequency of inundation by these moderate flows." The term "moderate flows" must be defined. The analysis must be revised to properly consider cottonwood recruitment and moderate flow events, as described above.

10.2.8 Disregard of Non-Major Recruitment Events

Resources Report, Section 5.8.2, Establishment of Plains Cottonwood Along the Poudre

Statement: "*An examination of cottonwood age classes in the Fort Collins reach of the Poudre River found the last major recruitment year was 1983 (Shanahan 2011a). The lack of natural lateral migration of the*

Poudre River has manifested a riparian forest that is no longer connected to the high flows and flooding with which the forest historically evolved (City of Fort Collins 2011)."

Comment: The SDEIS focuses on the last major recruitment event on the Poudre River in 1983. Fort Collins' experience suggests that armoring, and associated constraints on the channel and banks, as well as an altered species composition, most limits successful regeneration. The widespread recruitment observed at restoration sites following the 2014 spring flows (which peaked at ~6,000 cfs in late May) demonstrates the accuracy of this concept. This contradicts conclusions in the SDEIS, which state that the current flow regime is the major limiting factor.

The above image from McMurry Natural Area provides evidence of the potential for current flows to establish cottonwoods when the right physical conditions are present. 2015 seedlings are smaller (in the foreground) and 2014 saplings are seen on slightly higher ground (in the middle of the picture). *See State Farm*, 463 U.S. at 43 (explanation is not "satisfactory" if the "explanation for its decision . . . runs counter to the evidence before" the agency.). The analysis must be revised to address the role of moderate flood flows as well as topographical limitations to cottonwood recruitment.

10.3 COMMENTS REGARDING AQUATICS AND FISHERIES

10.3.1 Lack of Temperature Analysis

SDEIS Section 4.3.2.2, River Temperature

Statement: "*Thus, all NISP alternatives would be expected to increase stream temperatures at times in some reaches of the Poudre River. Additional detail on the conceptual understanding of the system and qualitative anticipated effects of NISP alternatives on stream temperature are provided in Hydros (2014a).*"

Comment: The SDEIS includes only a qualitative review of water temperature data with a subjective discussion of potential changes with NISP. The lack of a quantitative analysis of change in water temperature does not allow an evaluation of impacts to the aquatic species. The conclusions of "minor or moderate" impacts to aquatic resources and fisheries are not supported without quantification of the amount of change.

The Hydros 2014 Stream Temperature Report ("Hydros Report") is qualitative only with no quantification of change in temperature with the proposed alternatives, which GEI cites for water temperature impacts to fish and macro invertebrates. However, Hydros conducted dynamic water temperature modeling for the Windy Gap Firming Project EIS and CWA Section 401 certification. Miller Ecological also conducted dynamic water temperature modeling for the Moffat Collection System EIS and CWA Section 401 certification. No adequate basis is provided for the lack of such an analysis for NISP.

The change in Daily Maximum ("DM") and Mean Weekly Average Temperate ("MWAT") are derived from an hourly water temperature model. The CDPHE has protocols to determine the antidegradation analysis for the project from the modeled data. The anti-degradation calculation first calculates a Baseline Allowable Increment ("BAI"), which is 15% of the value between the baseline water temperature (current conditions) and the temperature threshold (either DM or MWAT). For example, if the baseline water temperature is 1.0 C away from the threshold then any change in water temperature greater than 0.15 C is considered a significant degradation. The analysis is complex to complete both the modeling and the antidegradation analysis.

The Baseline Allowable Increment ("BAI") for water temperature like other water quality constituents is 15%. The 15% translates to 0.15 C change for every 1.0 C lower than either the DM or MWAT threshold. The incremental change decreases the closer the water temperature gets to the threshold. If NISP results in an increase in water temperature, then the BAI may be smaller for Fort Collins when the Corps completes the analysis for the Halligan Project.

The lack of quantification of water temperature does not allow Fort Collins to meaningfully analyze NISP's impacts to aquatic resources in the Poudre River corridor. The change in water temperature is perceived to be small. However, even a small change in water temperature can result in a significant impact. The impact could be to the aquatic resources or to water treatment facilities in meeting discharge requirement, or both.

The full analysis of water temperature must be completed prior to release of the final EIS. Adequate review of the modeling approach and data sets should be allowed for participants in the Common Technical Platform. For example, Fort Collins should be provided with interim products to review the applicability and adequacy of the analyses. Mitigation for any approved alternative should include a requirement designed to offset any water temperature increase. The mitigation could be release of some amount of cold or cool water to offset the water temperature increase. The current mitigation is conceptual and does not include a sufficient detail and analyses to meet the applicable legal requirements.

10.3.2 Approach to Impacts on Aquatic Biological Resources

SDEIS Section 4.12, Aquatic Biological Resources

Statement: "*This section summarizes the predicted potential aquatic biological resources effects of the NISP alternatives. Fish, benthic invertebrate, periphyton, and aquatic plant communities and their habitat represent the components of the aquatic environment of interest for the project. […]*"

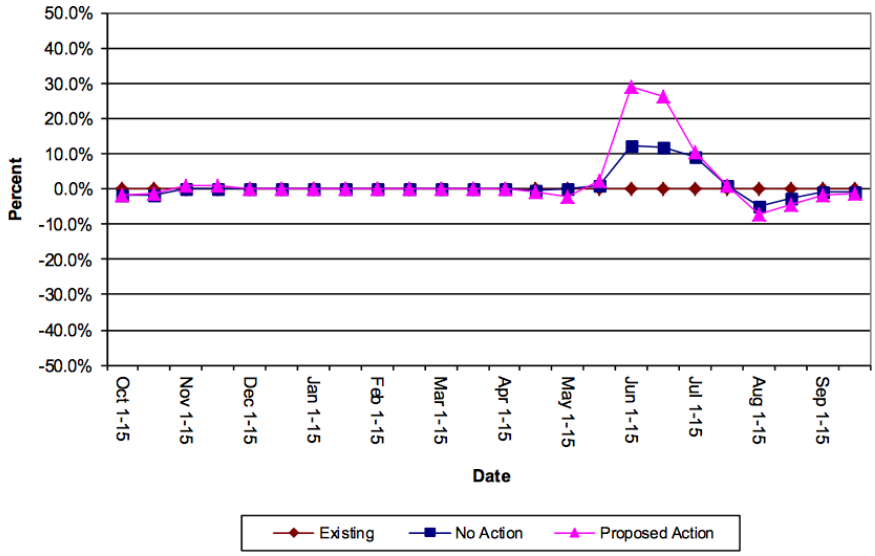
Comment: The conclusions for impacts of the NISP alternatives on aquatic habitat are based on an overly simplistic approach to calculation of changes to aquatic habitat. The change in fish habitat is based on synthetic graphs of 20%, median and 80% habitat constructed from a 25 year daily habitat time series. The annual graphs are then summarized into minimum, maximum and average habitat values. The percent change between the single average value derived from a 25 year daily simulation is used to determine the level of impact. This oversimplification of a detailed analysis does not allow the evaluation of inter- and intra-annual changes in habitat, which affect the fish species. (Annear et al. 2004). Further, there is no means to directly compare a habitat value with a specific discharge.

Page 4-314 of the SDEIS discusses changes in habitat with changes in flow. However, there is no means to verify any of the statements since computational data for habitat-flow time series is not presented in the supporting aquatic resource technical documents. For example, the recent EIS for the Windy Gap firming project included the basic habitat time series data by water year type as part of the technical supporting documentation (see following example Figure 3-101, Windy Gap Firming Project FEIS). The display of habitat by water year type or actual year allow the reader to make a direct comparison of habitat change between alternatives.

The aquatic habitat analysis up through the development of habitat versus flow determinations follows the standard approach used in instream flow studies. (Bovee et al. 1998, USGS 2001). The divergence from the standard approach is in the calculation of habitat over time. The use of a synthesized habitat values based on recurrence and then a single average value derived from the synthesized data masks the relationship of habitat over time. This approach does not allow a full analysis of impacts to the aquatic resources within Fort Collins, especially in the downtown corridor, which is highly valued.

The analyses and conclusions must be revised in these proceedings to address the deficiencies described above

Figure 3-101. Percent change in adult brown trout habitat from existing conditions on the Colorado River below Windy Gap for an average water year.



10.4 COMMENTS REGARDING ANALYSES OF WETLANDS AND RIPARIAN AREAS

10.4.1 Lack of Defined and Objective Standards

SDEIS Section 4.9.2, Methods, Page 4-213

Statement: "*Moderate effects would result in a clearly detectable change, with measureable effects. Moderate is used when beneficial or adverse effects would be noticeable, and the existing wetlands, riparian resources, or other waters would likely be lost. Moderate effects typically are long-term. Major effects would result in readily apparent effects with substantial consequences. Major is used when permanent impacts on large areas (10 acres) of wetlands, riparian areas, or other waters would occur.*"

SDEIS Section 4.12, Aquatic Biological Resources Methods

Statement: "*The overall impact was categorized as negligible, minor, moderate, or major according to professional judgment by taking into account the individual impacts to the components of the aquatic environment based on the magnitude of the changes, the risk of crossing an ecological threshold, the changes in habitat availability for other species and life stages in that segment, and the predicted changes to other relevant aspects such as water quality, temperature, channel geomorphology, sedimentation, and riparian vegetation.*"

Comment: The reliance on professional judgment without distinct metrics defined to determine the relative change between alternatives precludes replication of the conclusions in the SDEIS regarding of the level of effect. The subjective determination of impact makes it difficult to determine if any proposed mitigation is adequate to minimize the impact from an alternative. The above are

examples of the vague, qualitative language and standards used throughout the SDEIS. The SDEIS does not identify solid, scientific basis or objective standards for the proffered definitions.

For instance, regarding the statement from SDEIS Section 4.9.2 above, the permanent loss of wetlands is considered only a "moderate" effect despite its permanent nature. Also, the determination of "major" effect as one greater than 10 acres of permanent loss appears arbitrary without any reference to a reason for this delineation. In this arid region, riparian habitats and wetlands represent a small portion of the arid landscape and yet provide critical support for a majority of wildlife and increase overall richness in the region (Merritt et al. 2010, Naiman et al. 1993, Webb and Leake, 2006). Given the importance of these habitats, a reference or explanation for these definitions is required.

The analyses must clearly set forth all definitions and standards and the bases therefore. To the extent that this has not been completed in the SDEIS, the subject analyses must be revised accordingly.

10.4.2 Inconsistent Identification of Acres of Effected Wetlands

SDEIS Section 4.9.9, Impact Summary, Page 4-250

Statement: "Table 4-68 *Summary of unmitigated effects on wetlands and waters. 9 acres permanent impacts under Alternative 2.*"

2014 Riparian Effects Technical Report, Section 4.3.3, Page 41

Statement: "*The mapped potentially sensitive vegetation classes for Segments A through F are presented for varying distances from riverbanks in Table 14. For the entire length of the Mainstem there are about 220 acres of the potentially sensitive vegetation classes. Segment B is about 6 miles long and has about 10 acres of potentially sensitive vegetation within 100 feet of the river.*"

Comment: The SDEIS and its supporting reports appear to inconsistently quantify the number of effected wetlands, specifically for Alternative 2 in Segment B and with the result of reducing the number below the potentially-arbitrary threshold of 10 acres. This value is presented as 10 acres (a major effect) in the Resources Report and as 9 acres (a moderate effect for Segment B) in the SDEIS and summaries.

The analyses must correct or explain this discrepancy and the reasons therefore. The analyses must also apply all thresholds and standards in a consistent and objective manner. To the extent that this has not been completed in the SDEIS, the subject analyses must be revised accordingly.

10.4.3 Inconsistencies in the Riparian and Wetland Analyses

SDEIS Section 4.23, Summary, Page 4-415

Statement: "Table 4-109 *Wetlands from Poudre River flow changes (indirect effects).*"

Comment: Background on this analysis is provided in the Resources Report. On page 25 of that report, it states "the repeated stress of numerous years with prolonged groundwater declines could lead to loss of wetlands; however, most herbaceous wetlands would recover in subsequent years when the hydrologic support returns." If wetland hydrology is lost for a prolonged period of time, but returns occasionally (and infrequently such as during wet years or precipitation driven flood flows), this should be considered a permanent impact.

The summary table provided at the end of Section 4 of the SDEIS is the most succinct and comprehensive presentation of impacts of the alternatives in the SDEIS. However, this table omits the riparian areas despite having identified minor to moderate impacts throughout Table 4-69. Without explanation, this is arbitrary and suggests that the impacts from Alternative 2 are fewer and less severe that the underlying analyses indicate.

Table 4-69 also summarizes conclusions on river stage, alluvial groundwater, inundation, and other flood related functions analyses which are all linked to groundwater and soil saturation in the riparian zone. They should, at a minimum show common trends and scale of responses. However, Table 4-69 presents inconsistent and sometimes opposing results. For example, the results for Alternative 2 for "River Stage" are a moderate effect on Segment B whereas for "Alluvial Groundwater" a negligible effect is anticipated. Similarly, regarding "Inundation" there will be negligible impacts whereas for "Other Flood-Related Functions" (directly related to inundation) moderate effects are predicted. It is confusing for these pairs of analyses to show results that span from imperceptible to long term loss of resources.

Additionally, the last line on Table 4-109 describes "Other Flood-Related Functions." A determination of moderate effect is made for Alternative 2. However, the only reference to this conclusion comes from a single sentence on p. 4-218 (Indirect Effects Common to all Alternatives): "Reductions in inundation would potentially have some level of effect on these functions or the frequency at which these functions are provided." The conclusion lacks a basis. It is important as these processes support critical resilience factors such as pollutant filtration and floodwater attenuation. It msu be supported by something more than a single, conclusory sentence that is apparently without basis.

These contrasts and vacillations over the impacts to wetlands and riparian areas do not enable Fort Collins, other stakeholders, and ultimately, the Corps, to meaningfully analyze the impacts to these resources.

The analyses must consistently treat all alternatives. To the extent that this has not been completed in the SDEIS, the subject analyses should be revised accordingly. This confusion over the timing of impact of Alternative 2 persists throughout the Riparian and Wetland Conclusions, as discussed elsewhere in these comments.

10.4.4 Failure to Adequately Consider Long-Term Changes Resulting from NISP

Resources Report, Section 3.4, Wetland Functions, Page 12

Statement: "*Of the nine fundamental variables, only water source, water distribution, water outflow, chemical environment, and geomorphology are expected to potentially change in the short term for riverine wetlands as a result of the NISP alternatives.*"

Comment: It is not clear why the above-referenced analysis only considers short-term changes. NISP would cause a permanent change in the flow regime of the Poudre River that will affect wetland conditions and related functions. Long-term changes to hydrology and vegetation variables, and the related changes in functions, must be fully analyzed.

10.5 COMMENTS REGARDING GROUND WATER ANALYSES AND ISSUES

10.5.1 Inaccurate Assumptions about Ground and Surface Water Interactions

SDEIS Section 3.5.3, Poudre River, Page 3-85

Statement: "*The river loses water to alluvial groundwater where the river crosses very permeable former channels and regains water when the river crosses former channels farther downstream. (ERO 2012b).*"

SDEIS Section 3.5.3.4, Poudre River Study Sites, Page 3-89

Statement: "*Water level observations at the six transects show a range of relationships between the alluvial ground water and river stage. […] In these areas, if alluvium receives recharge from a rising river stage, the alluvium discharge this water back to the river within a very short period.*"

SDEIS Section 4.5.1, Methods, Page 4-177

Statement: "*Using the largest predicted stage reduction at each study site for each of the action alternatives, and river stage-ground water relationships developed for each monitoring well, graphs were constructed with predicted reduction in depth to ground water as a function of distance from the river for the action alternatives (ERO 2013b).*"

Comment: The description of river losses on the Poudre River in the SDEIS oversimplifies such patterns and establishes inaccurate assumptions for the subsequent impact analysis of Fort Collins' wetlands and riparian resources.

The analysis disregards key aspects of the alluvial exchange processes, it should be revised, e.g., to consider:

- The alluvium throughout the river corridor is quite permeable, and alluvial recharge is more widespread and complex than flow through "former channels" implies.
- River gain-loss patterns are influenced by streambed heterogeneity, variations in streambank material, channel geometry, saturation, evapotranspiration, and local groundwater and surface water elevation. As a result, the volume of water recharging the alluvium and its residence time will vary depending on differences in hydraulic head between the river and surrounding aquifer (per Darcy's Law). These head differences are in turn influenced by

numerous local factors such as ditch diversions, supplemental recharge, etc. which vary on subreach and site-specific scales.

- Even brief transient recharge is important for ecosystem processes, such as nutrient processing, and should not be discounted.

10.5.2 Shortcomings in the Data Used for the Ground Water Analysis

SDEIS Section 4.5.1 Methods, Pages 4-176 to 4-177

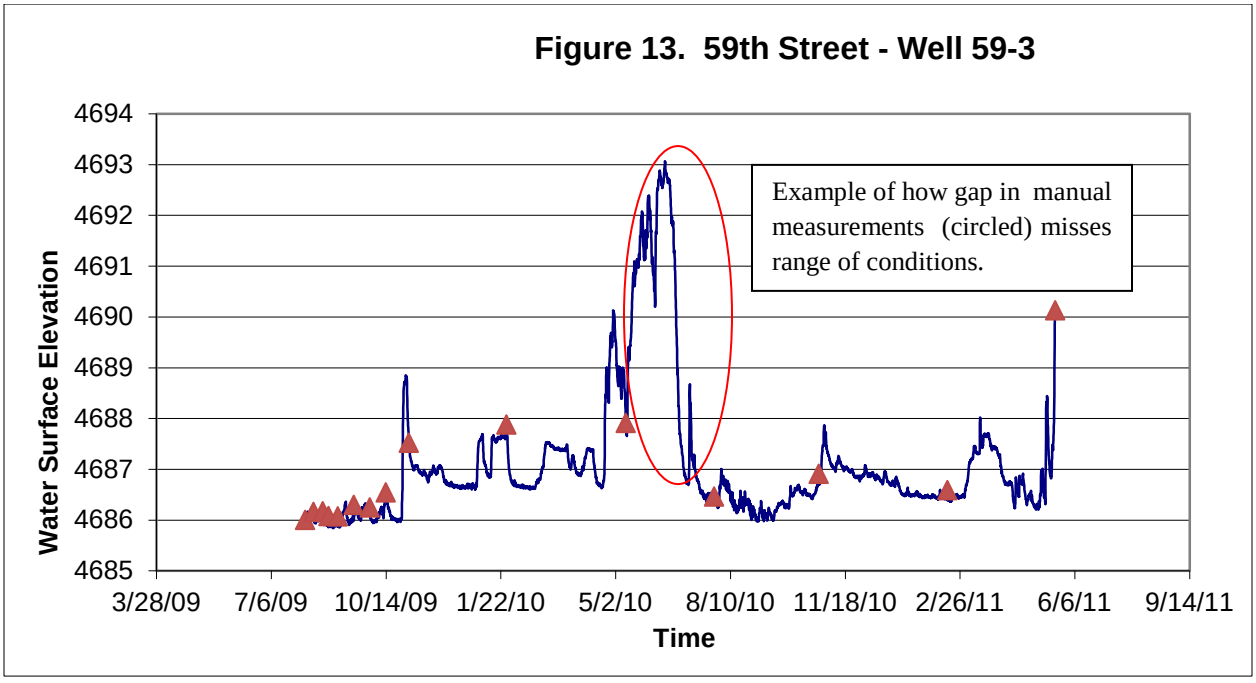
Statement: "*As part of additional studies performed for the SDEIS, a hydrologic investigation of the mainstem of the Poudre River was conducted from 2009 through 2011. […] The 2012 Ground Water Report (ERO 2012b) provides details for the six transects that were established along the Poudre River, data collection methods, and discussion and interpretation of the results. […] Using the largest predicted stage reduction at each study site for each of the action alternatives, and river stage-ground water relationships developed for each monitoring well, graphs were constructed with predicted reduction in depth to ground water as a function of distance from the river for the action alternatives (ERO 2013b).*"

Comment: Data used to establish the river stage-ground water relationships appear not to be representative, complete, or consistently interpreted as described below.

As identified in Fort Collins' comments to the Draft Baseline Ground Water Technical Report in August 24, 2011, which are part of the administrative record in these proceedings, ground water wells at Lee Martinez Park may not be representative of the segment because they are located in areas that are supported by supplemental ground water recharge due to their proximity to a flooded gravel pit having a water surface that is maintained at an elevation about 10 feet higher than the river due to the inflow of "salvaged water." The SDEIS and the 2013 Ground Water Effects Analysis support the City's concerns from 2011. While it is true that upgradient groundwater recharge may occur in numerous other places along the river, the magnitude of these influences on the water table varies. For example, variation in groundwater levels is evident within the Martinez transect itself, where piezometers located at similar distances from the river but on opposite sides respond quite differently. During the EIS study, for example, the differences in reported ground water elevations for L3 and L4 – which are relatively equidistant and across the river from each other – was an average of 0.87 foot and ranged from 0.27 foot (9/16/09) up to 6.21 foot (5/11/09). These local variations in the aquifer make it questionable to apply relationships established based on distance from the river in one location to another location, even in the same segment.

The SDEIS is inconsistent by first stating that groundwater monitoring at the study sites should be considered "as a whole," but then eliminating data from two of the six transects because the observed measurements did not fit the anticipated patterns for distance from the river relationships. According to the Wetlands and Riparian Effects Technical Report, page 8, "Because a clear relationship of change in ground water levels and river stage with distance was not apparent at Eastman park and 59th Avenue, an average of the four other sites was calculated to estimate the percent change of ground water based on stage changes at various distances." The rationale for applying transect data from one location to another is not sufficiently justified, and if one-third of the study results do not fit within the hydrogeologic conceptual model and analysis method, it suggests the model and method need to be refined.

The datasets used to establish the river stage-ground water level relationships are incomplete because continuously recorded data from loggers were not available for all wells or river stage locations. Widely-spaced, manual readings (and weekly average readings) do not capture the full range of relationship between river and groundwater. This is an important consideration because Lee Martinez Park did not have a river logger, so the river stage-ground water relationship was based on sporadic manual readings that cannot accurately reflect the relationship. To demonstrate the type of data that can be missed see the figure below (Modified Figure 13 from the ground water technical report) which compares manual readings (red triangles) to continuous logger readings. The circled period of record demonstrates how the entire groundwater peak was missed by the manual readings in spring 2010.



It is also unclear how accurate river stage-groundwater relationships could have been established for "each monitoring well," when half (14) of the 28 wells and two of the six surface water stations were not equipped with continuous data loggers. Additionally, for two of the reaches, piezometer data were not used and instead averages from the other four sites were applied, and by definition using an average will not show maximum effects.

Rather than discount or replace site-specific data with averages from other segments, river subreaches could be characterized based on hydromorphic classifications (e.g., based on similar geometry, boundaries, upgradient influences) and relationships could be developed and applied based on their classifications. Site-specific data could be used, at a minimum for comparison, with each pieziometer having its own water table fluctuation relationship, despite the fact it may not be linear.

SDEIS Section 4.9.4, Indirect Effects Common to Action Alternatives, Page 4-219

Statement: "*The effects of decline in river stage on alluvial ground water levels greater than about 100 ft from the river are predicted to be generally less than the 0.5 ft impact threshold.*"

SDEIS Section 4.5.7, Impact Summary, Page 4-187

Statement: "*As discussed above, reductions in alluvial ground water levels were used to predict resource effects and are addressed in those sections of the SDEIS. The predicted reductions to ground water levels in the alluvium would be similar for all action alternatives. Within 50 ft of the river, ground water level differences between the alternatives would be a maximum of about 0.5 ft. The difference in predicted reductions in ground water levels between alternatives would decrease as a function of distance from the river (4-59).*"

Comment: The basis for the statement in Section 4.9.4 is unclear. According to Figure 4-59, changes in depth to ground water greater than one foot were predicted at each of the graphed sites beyond the 100 foot distance from the river. Therefore, the 100 foot distance from the river appears to be unfounded, and groundwater impacts occur at further distances.

Furthermore, based on the data collection and analysis methods that were used, it is unknown if impacts greater than 0.5 foot and/or beyond 50 foot from the river may occur. The impact analysis using the distance from the river function does not address times and locations where the river influence extends further out due to factors such as river configuration and more permeable alluvial deposits. Impacts at greater than 100 feet from the river in some segments should be more fully evaluated.

10.5.3 Misinterpretation of Data

SDEIS Section 4.5.3.2, Poudre River Segments, Page 4-182

Statement: "*...The effect of these buried channels can be seen on Figure 4-59 where predicted ground water level reductions are out of character with distance from the river and neighboring monitoring wells.*"

Comment: The observed influence of the river at greater distance from the river is not "out of character" but rather reflects the character of many places along the river. The alluvium is very heterogeneous with permeable pockets of material, not just channels, known to occur throughout the deposits. It is not surprising for river influence to occur at greater distances from the river than the analysis expected, and it is not out of character. These observations demonstrate the limitations of assessing impacts to wetlands and riparian areas based on the distance from the river approach. This interpretation should be re-evaluated.

SDEIS 4.5.3.2.1 Poudre River Segments, Segment C, Page 4-183

Statement: *"Similar to Segment B, the reductions in ground water levels decrease in a relatively short distance from the river."*

Comment: The reduction in groundwater levels in this segment is not similar to Segment B, so this statement appears to under report the effects. At 200 feet from the river in Segment C, there is still a 1-ft decline in ground water for the three alternatives, which is twice the impact observed in Segment B at the same distance (where only 0.5 foot decline is observed, probably due in part to the upgradient recharge as previously discussed). This interpretation should be re-evaluated.

SDEIS Section 4.9.4, Indirect Effects Common to Action Alternatives, Page 4-219

Statement: "Table 4-70 in Section 4.9.9 summarizes the predicted depths to the alluvial ground water level for the action alternatives. None of the declines in groundwater levels within the cottonwood woodlands are predicted to be greater than 2.5 ft below the deepest annual water table depth during the growing season. Effects on the cottonwoods associated with declines in river stage of 2 feet or greater are predicted to be limited to periodic short-lived stresses because the estimated declines in alluvial ground water levels are predicted to occur infrequently (i.e. not predicted to be sustained) and are generally predicted to occur in May at the beginning of the growing season when soil moisture conditions are typically favorable for supporting cottonwoods without dependence on shallow ground water levels."

Comment: Impacts of ground water declines in riparian areas appear to be underestimated for multiple reasons. There appears to be insufficient basis to claim that the maximum declines will be limited to periodic short-lived stress. The frequency, duration, and impact of declines will be influenced by the change in the volume of water storage and availability in the riparian zone (e.g., which could be done using a daily water budget approach). There is no discussion of the effects of change in the volume of riparian water storage over time, e.g., to address impacts when there is already a groundwater deficit due to drought years or extended incremental declines in recharge. Reliance on May precipitation and soil moisture to offset impacts is inherently uncertain and should not be justification for discounting negative effects. Further, May precipitation already affects the system and is not a new measure to offset NISP diversions. The ecological significance of some key exchange processes between rivers and ground water are not evaluated. For example, saturated soils during alluvial recharge play an important role in nitrogen processing (and can provide a nitrogen pulse at a critical time in the growing season) when e.g., anaerobic conditions trigger microbial denitrification. This interpretation should be re-evaluated.

10.6 COMMENTS REGARDING ANALYSES OF POUDRE RIVER WETLANDS

10.6.1 Inappropriate Assumption of Changes in River Stage of 0.5 Feet or Less

SDEIS Section 4.5.1 Methods, Pages 4-176 to 4-177

Statement: "*This approach was taken because most of the reductions in river stage are predicted to be 0.5 ft or less (Appendix A of the 2014 Wetland and Riparian Effects Report) and therefore would have had only minor reductions on associated alluvial groundwater levels. A maximum effect scenario was of interest because alluvial ground water levels can influence cottonwood woodlands and reductions in ground water levels below the annual water table low (Section 4.3.1 of the 2014 Wetland and Riparian Effects Report.)*"

Resources Report, Section 4.2.2, River Stage, Page 21

Statement: "*Changes of 0.5 foot or greater in river stage during the growing season was selected as the threshold for potential impacts because herbaceous wetlands would likely start being affected by groundwater declines of greater than 0.5 foot. Declines in ground water elevations during the growing season of less than 0.5 foot are well within the range of normal fluctuations that are already occurring as observed in monitoring wells at the riparian vegetation study sites (ERO 2012a).*"

SDEIS Section 4.9.2.1.1, Impact Thresholds, Poudre River Stage, Page 4-214

Statement: "*….were reviewed for changes in river stage of 0.5 foot or greater during the growing season... A threshold of 0.5-foot decline in river stage was used to determine potential effects on herbaceous and shrub wetlands. Herbaceous wetlands are potentially the most sensitive communities to declines in alluvial ground*

water levels. The Corps' technical standard for wetland hydrology is that the wetland site is inundated (flooded or ponded) or the water table is 12 inches or less below the soil surface for 14 or more consecutive days during the growing season at a minimum frequency of 5 years in 10 (50% or higher probability) (Corps 2005). Assuming an average midpoint of 0.5 foot for ground water levels for wetlands, a decline of less than 0.5 foot in ground water levels would still meet the threshold for wetland hydrology."

Comment: Using the 0.5 foot decline combined with a mid-point of 0.5 foot ground water level below ground surface is an inappropriate threshold for assessing wetland impacts for a maximum effects analysis, and the basis for this approach is neither justified nor logical. A wetland with an initial water table near the 1 ft depth would be impacted by declines of less than 0.5 ft. If, for example, a wetland has a water table depth of 11.9," then a decline of less than 0.2 foot could cause a shift from wetland to non-wetland hydrology. Therefore, a maximum effects analysis should evaluate impacts from a lower starting elevation in herbaceous wetland areas (especially based on the assumption that in a dry year the water table will likely be starting out at a worst case scenario).

Section 4.2.2 is the first location in the SDEIS that this threshold is identified. However, no basis for this threshold is provided; and such a threshold is not a convention in wetland science. The response of vegetation and soil microbiota to changes in ground water levels and fluctuations is different in different textured soils, on sites with stable versus variable water tables, and on plants with different root morphologies and physiological responses. The SDEIS ignores the context and range of possible responses for the Poudre River. The statement that the 0.5 foot of fluctuation and decline falls within normal ranges of fluctuations is not relevant since the alternatives do not affect these short-term fluctuations, but rather, they compound them and cause a long-term decline of average ground water depths amidst ongoing smaller fluctuations. This will cause significant and long-term changes in wetland hydrology, which will cause changes in vegetation composition and structure, soil microbial processes, and habitat quality.

The assumption that river stage declines exceeding 0.5 foot for greater than 10% of the period of record may adversely impact wetlands is flawed as discussed above. It would be more realistic and less arbitrary to base the approximate average depth of groundwater for wetlands on the type of wetland plant community present along the corridor. For example, *Typha* (cattail) and *Scirpus* (bulrush) would have groundwater at approximately ground level (fully saturated soil column and possibly standing water), a community dominated by *Carex nebrascensis* would have groundwater at approximately six inches to one foot, and a *Salix exigua* dominated system may have ground water at depths of greater than one foot (Henszey et. al., 2004). Thus, certain communities are more vulnerable to changes in depth to ground water and seasonal fluctuations in ground water.

Any wetland community with the average groundwater table deeper than six inches may no longer be able to support wetland plant communities and wetland functions with a reduction in groundwater less than 0.5 foot. For example, cattail marshes would likely see a shift in species composition whereas drier wetlands like those dominated by *Carex nebrascensis* may be completely lost (Henszey et. al., 2004).

The analysis should be revised and corrected so as not to include the assumption of uniform response to altered wetland hydrology as discussed above. If no alternate approach is applied,

examples of other federal permits or peer reviewed research that has used this approach should be provided to help the reader understand the basis for the conclusions reached.

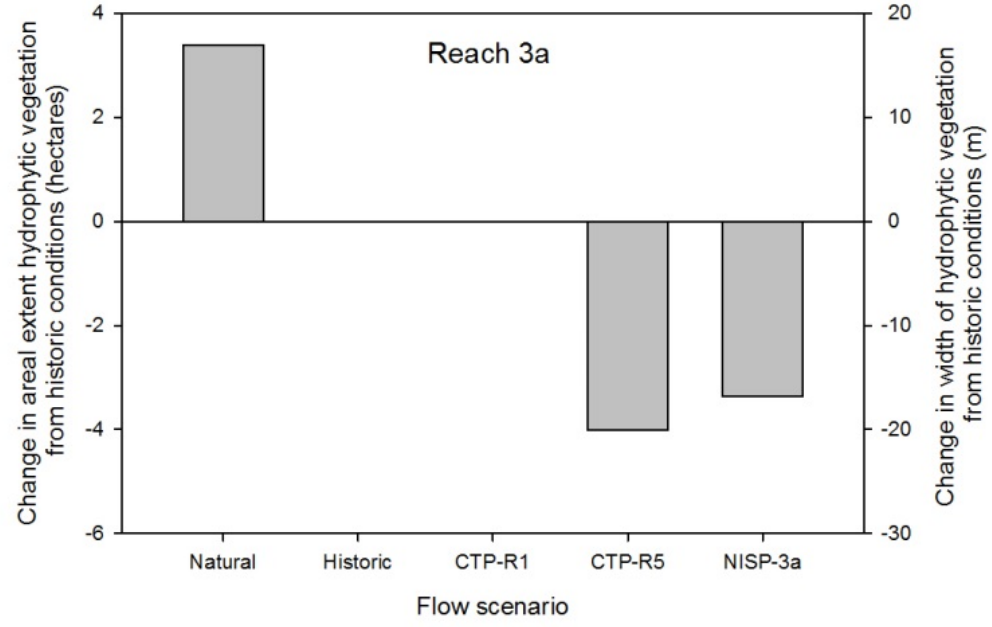
10.6.2 Inappropriate Assumption of Changes of a Duration of 10% or Less

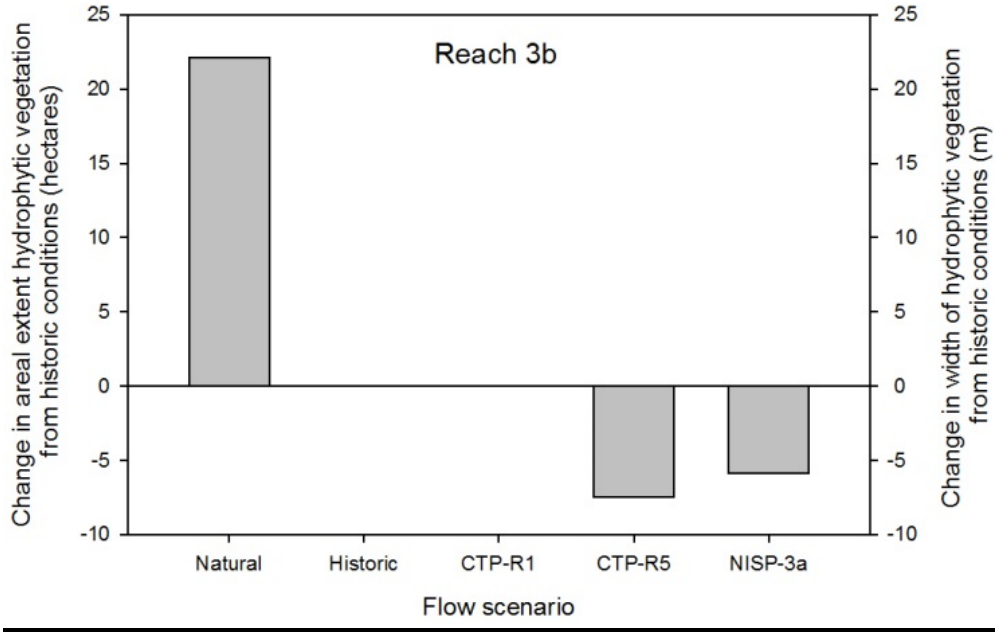
SDEIS Section 4.9.2.1.1, Impact Thresholds, Poudre River Stage, Page 4-214

Statement: "*At 10% or less the effect would be negligible because 10% represents an average of 2 weeks during each year of the growing season and the Corps' technical standard for wetland hydrology is that the wetland is inundated…for 14 or more consecutive days…..*"

Comment: If a site currently has wetland hydrology for two weeks per year (thereby just marginally meeting the USCOE standard for jurisdicaitonal wetland), then a shift of less than 10% of the period (such as one week per year) will cause the site to be inundated less than the two-week criteria in the USCOE definition. Altering hydrology, by definition, will indeed cause changes in the inundation duration. This is a cause and effect linkage that cannot be contested. The changes will effect wetlands acorss the entire gradient, but more so for those wetlands just inside the two week of inundation criteria.Such an averaging approach misses a considerable area of wetlands that will be affected and results in an underestimation of impacts. Hydrology is what distinguishes wetlands and riparian areas from adjacent uplands. The effects of altered flows well established in the literature (e.g., Merritt et al. 2010). Reduced peak flow, and reductions in inundation duration will cause narrowing and decreased extent of riparian areas and areal loss of wetlands.

Further, Fort Collins has run the CTP hydrology through its ERM vegetation model and has made the following findings. (Please see Appendix B5 Riparian Vegetation of the Poudre River Ecosystem Response Model for methods.) The results of this modeling are shown in the following graphic. The graphic illustrates the expected reduction in the width of hydrophytic vegetation in two reaches of the river from about the Larimer and Weld diversion to the Lake Canal in Martinez Park. Clearly the preferred alternative would have substantial long-term impacts to this band of vegetation. The analysis should be revised to not include the subject assumption as discussed above.





10.6.3 Inappropriate Assumption Regarding a Shift in Wetland Vegetation

SDEIS Section 4.9.2.1.1, Impact Thresholds, Poudre River Stage, Page 4-215

Statement: "*Stage declines of this magnitude during the growing season are predicted to results in a shift in species at wetlands dominated by obligate wetland species (i.e. cattail and threesquare bulrush) to those that tolerate greater fluctuations in river stage such as reed canarygrass. Since most wetlands along the banks of*

the mainstem are dominated by reed canarygrass and sandbar willow, two species that can tolerate greater range of groundwater levels effects are predicted to be minor and likely not perceptible along Segment B."

Comment: The overall basis of the wetlands analyses lies in whether any given wetland is going to shift from a wetland supporting hydrology that meets the definition of a wetland given the Corps' standards. The argument in the SDEIS shifts here, as cited above, to explain any potential impact to focus on species. However, this shift in focus does not change the fact that the subject wetlands will be lost as a result of NISP. Further, shifts in hydrology that favor generalist and stress tolerant species like reed canary grass is undesirable as this is a non native species that is persistent and competes for resources and space with desirable native riparian species.

Further, the statements made about shifts in species are based upon speculation rather than data and information. The SDEIS cites no analyses, no species distribution modeling, or other objective assessment to support the statements. There has been no consideration of context. For instance, species distributions might shift toward the channel. No evidence is provided to support the statement that most wetlands are reed canarygrass and sandbar willow.

The analysis should not include the above statements unless they are supported by an analysis, modeling, or other objective assessment. To the extent that this is not completed, such statements should not be included in the analysis.

10.6.4 Failure to Consider Permanent Shift in Poudre River Flows

Resources Report, Section 4.2.2, Stage Effects on Herbaceous and Shrub Wetlands, Page 24

Statement: "*Many types of wetlands in the West experience periods of drought and water stress each growing season but are resilient when supportive hydrologic conditions return. The repeated stress of numerous consecutive years with prolonged ground water declines could lead to the loss of wetlands; however, most herbaceous wetlands would recover in subsequent years when the hydrologic support returns.*"

Comment: The preferred alternative causes an absolute shift (decline) in groundwater levels. Even if wetlands in the western United States experience periods of drought and could recover, there is a quantifiable change that would occur under the preferred alternative. This explanation seems to be excusing the impacts rather than identifying them. A longer period of drought to a wetland can lead to a reduction in wetland condition (loss of functions, shifts in species composition) and/or a change or loss of the wetland plant species (often resulting in noxious weed invasion) Occasional return of the hydrology does not enable the plants to spontaneously return and favors non-native, weedy, ruderal plant species over native, perennial species.

The analysis should be based on the correct assumption that the changes to the Poudre River flow regime from NISP are permanent, and use this information to accurately describe and analyze wetland impacts. The analyses and interpretations should be revised accordingly.

10.6.5 Inappropriate Reliance on CDOW Mapping

Resources Report, Section 5, Existing Conditions Methods, Page 17

Statement: "*About 53 percent of the CDOW mapping within the area defined as the riparian corridor was field reviewed from publicly accessible sites or by remote sensing, and inaccuracies were changed to the appropriate category. Of the areas reviewed, about 49 percent of the CDOW-mapped areas were changed to another category.*"

Comment: The analysis and conclusions depends on the CDOW riparian mapping dataset. The fact that field verification of this data set reports only 51% accuracy is of significant concern and undermines its use in the SDEIS and supporting reports. This is not a scientifically defensible level of confidence. Furthermore, the minimum mapping unit for this methodology is 0.5 acre which would indicate small patches of wetlands, as expected in northern Colorado, may be missed or mischaracterized.

In 2011/2012 the Environment Protection Agency and Fort Collins provided comments on the initial draft of this technical report. Both sets of comments expressed concern regarding the high level of inaccuracy and uncertainty found during field review. The other option suggested was to rely instead on the U.S. Fish and Wildlife National Wetlands Inventory ("NWI") mapping data set.

The Corps responded that the CDOW mapping "will be used to describe the general extent, distribution, and composition of riparian vegetation along the mainstem of the Poudre River." Instead, the CDOW mapping seems to be the source of data for quantifying potentially impacted wetlands along the Poudre River. The NWI dataset recently completed along the Poudre River is the best data available for the subject wetlands. Additionally, Fort Collins Natural Areas has ongoing updated habitat mapping for restoration planning

10.6.6 Failure to Identify the Data Source for the Acres of Wetlands Impacted

Resources Report, Section 3, Methods, Page 4

Statement: "*Mapping of the vegetation was conducted on two levels: detailed mapping at the six riparian vegetation study sites …and broader vegetation mapping along the Mainstem from Colorado Parks and Wildlife…to describe general habitat types along the Mainstem*"

Comment: The purpose of the above-identified analysis is to provide a prediction of the acreage of wetlands impacted. It is unclear which data source was used to extrapolate the final conclusions of the acres of wetlands impacted. Indirectly, it seems the Colorado Department of Wildlife ("CDOW") mapping project was the source. However, this is not expressly stated anywhere in the SDEIS or the technical reports. Furthermore, as noted above, Fort Collins requested the GIS files for wetlands and riparian areas impacted for all alternatives from the Corps. The dataset provided by the Corps includes no wetland polygons along the Poudre River adding to the confusion.

The analysis should clearly and expressly identify the data source and analysis used to identify the acres of wetlands impacted by NISP. The analysis should be revised to use the NWI dataset.

10.7 COMMENTS REGARDING EFFECTS TO RIPARIAN HABITATS AND ECOLOGICAL PROCESSES

10.7.1 *Inappropriate Application of the Definition of Wetlands to Cottonwood Woodlands*

SDEIS Section 4.9.2.1.3, Inundation, Page 4-216

Statement: "*For the purposes of the effects analysis, cottonwood woodland sites predicted to be inundated in at least 13 years (half of the years of the period of record) under Current Conditions were assumed to receive some amount of hydrological support from inundation based on the Corps' technical standard for wetland hydrology that the site is inundated (flooded or ponded) or the water table is 12 inches or less below the soil surface for 14 or more consecutive days during the growing season at a minimum frequency of 5 years in 10 (>50% probability) (Corps 2005).*"

Comment: The application of Corps definition of wetland hydrology to analysis of impacts to riparian habitats (non-wetlands) is incorrect and inappropriate. No explanation is provided in the SDEIS for the use of wetlands hydrology in this context. The impact assessment methodology and analyses should be revised to more accurately reflect the hydrology of riparian woodlands, as discussed above.

10.7.2 Inappropriate Exclusion of Certain Riparian Forests

SDEIS Section 4.9.2.1.2, Alluvial Groundwater, Page 4-220

Statement: "*Inundation has the potential to provide supportive hydrology for wetland and riparian vegetation; however, inundation of many of the locations within the Poudre River study sites under Current Conditions occurs infrequently. […] For all action alternatives, the riparian and wetland locations inundated in more than half of the years under Current Conditions hydrology, and thus potentially more dependent on frequent inundation, are not predicted to have a substantial decrease in the number of years in which inundation occurs.*"

Comment: Periodic inundation is precisely what makes a riparian forest unique from an upland forest and other types of wetted habitats. (Naiman and Decamps, 1997). To suggest that sites that receive inundation less than 50% of the years will not experience an effect underestimates the extent of important, functioning riparian areas.

For those sites that are inundated "frequently," which would more accurately be referred to as wetlands, a significant reduction in peak flows caused by Alternative 2 would also be expected to cause a shift (narrowing) of riparian vegetation on the landscape. Table 4-71 indicates 8 data points were used to assess a 2,500 acre study area. This is an insufficient sample size for extrapolating such a conclusion. The SDEIS does not address this result. The analysis should be revised to include all riparian forests, as described above.

10.7.3 Incorrect Conclusions of Impacts to Riparian Forests

SDEIS Section 4.9.5.3.3, Preferred Alternative, Inundation, Page 4-229

Statement: "*Segment B. The plains cottonwood woodland locations within the Martinez Park study site, representative of Segment B, have minimum inundation flows of about 2,000 to 3,200 cfs (Table 4-71). Under Current Conditions, these locations would be inundated in about 4 to 11 years of the period of record. The*

number of years in which inundation would occur is predicted to be reduced by 1 to 5 years at these locations. None of these locations would be inundated in more than half of the years of the period of record under Current Conditions. Under Alternative 2, the estimated reduction in inundation is predicted to have a negligible effect on cottonwood woodlands in Segment B because under Current Conditions, the cottonwood woodlands are not inundated with enough frequency to provide consistent hydrologic support."

Comment: For those sites that are inundated "frequently," a significant reduction in peak flows a caused by Alternative 2 would also be expected to cause a shift (narrowing) on the landscape and all the complex functions and vegetation types supported by the peak flows. (City of Fort Collins, 2015a, City of Fort Collins, 2015b, Shanahan et al., 2014). In contrast to this expected result, all narratives related to this inundation analysis for Segment B conclude the effects will be negligible. An example in central Fort Collins: The quote above for the impacts of Alternative 2 references Table 4-71. This table shows three points (LMT2.1-3) will have reduced frequencies of inundation from 42% of the years to 23% of the years. This will have an impact on the probabilities for many of the aforementioned processes to occur. Please see the 5 year flow -analysis (please refer to Section 10.7.6) and the plant guilds analysis (presented in Section 10.6.2) as evidence substantiating the importance of "infrequent" flows and the likely narrowing of all processes and habitat types reliant on moderate flows. The analysis should be revised to include all riparian forests, as described above.

10.7.4 Incorrect Conclusions Regarding Impacts of Recent Flooding on Riparian Forests

SDEIS Section 4.9.4, Indirect Effects Common to Action Alternatives, Page 4-217

Statement: "*Flooding on the Poudre River mainstem in 2010, 2011, and 2013 provided the opportunity to review how flood flows and inundation affect wetland and riparian resources. Post-flood reviews of the mainstem determined that most of the vegetation and riverbanks of the reaches reviewed appeared to be unaffected by the floods. […] There were no observable effects on vegetation from the inundation outside of the active channel or stream banks other than the flattening of herbaceous vegetation and the accumulation and piling of woody debris. […]*

"*Flows of this magnitude did not create substantial areas of either newly deposited sediments or eroded areas beyond the active channel and riverbanks that could provide potential suitable substrate for colonization by riparian vegetation. The floods in early June of 2010 and 2011 occurred during the normal time for peak flows that can facilitate the establishment of new cottonwood stands. Very few areas of post-flood cottonwood seedlings were observed and the few areas of cottonwood seedlings that were observed occurred within and adjacent to the active channel where the cottonwood seedlings are vulnerable to inundation, channel erosion, and aggradation.*"

Comment: Fort Collins Natural Areas Department staff's observations contradict the above statements presented in the SDEIS. For example, Sterling, Homestead, and McMurry Natural Areas have all experienced substantial deposition of fine-grained materials in much of the riparian habitat as a result of high flow events between 2010 and 2014. Furthermore, not all floodplain functions associated with inundation are readily observable and the observations from a sample of sites and years should not overrule well established and accepted riparian scientific principles. Even the SDEIS outlines the processes known to occur with inundation, yet the narrative uses field review exclusively for ignoring these readily acknowledged ecological processes (See SDEIS Section 4.9.4).

In areas undergoing restoration where shading and thatch is not a limitation, extensive and significant establishment of new cohorts of native woody vegetation is occurring regularly and in direct response to flood flows. These areas include Sterling, McMurry, and Homestead Natural Areas. The following three photos show natural establishment and recruitment of native vegetation (specifically cottonwood and coyote willow) following recent high flow years at the McMurry Natural Area along the Poudre River. Following the wetter springs of the past few years (2010 through 2014), Fort Collins Natural Areas Department staff has observed an increase in several uncommon and desirable plants. For example, clammyweed (*Polanisia dodecandra*) was established at Springer Natural Area, more goldensmoke (*Corydalis curvisiliqua subsp. occidentalis*) and an increase in violas, which support rare butterflies have also been observed in response to the wet years. At the same time dieback of smooth brome close the river's edge and generally an overall robust growth for all riparian vegetation was observed each of the wet years that have occurred between 2010 and 2015.

Another high prolonged flow year occurred in the spring of 2014. The previous two photos show observations by Fort Collins Natural Areas Department staff from the air in June, 2014. The first photo above shows the Sterling Natural Area and the second photo shows the McMurry Natural Area. Each identify depositional zones (pockets of fine material seen throughout the riparian areas), with the red circles identifying areas of significant fine sediment movement and deposition.

Inundation even for brief periods drives numerous functions that distinguish riparian habitat from upland terrestrial habitats. Some of the ecological and hydrological functions and processes can be difficult to observe and the observations from a sample of sites and years should not overrule well established riparian processes. Even the SDEIS outlines the processes known to occur with inundation yet the narrative uses field review exclusively ignoring the readily acknowledged ecological processes (See SDEIS Section 4.9.4).

The analysis should be revised to include the observations described above and to include a more in-depth analysis of impacts to the other floodplain processes associated with inundation.

10.7.5 Incorrect Conclusions Regarding the Response of Cottonwoods to the Diversion of Peak Flows

Resources Report, Section 4.3.1 Changes in Ground Water Levels for Cottonwood Woodlands, Page 35-38

Statement: "*Scott et al. (1999) noted that over a three-year period in medium-grained alluvial sands, sustained declines in the water table of greater than 3.1 feet resulted in 88 percent mortality of plains cottonwood. […]*

"*Effects to the cottonwoods associated with declines in river stage of 2 feet or greater are predicted to be limited to periodic short-lived stresses because these estimated declines in alluvial ground water levels are predicted to occur infrequently (i.e., not predicted to be sustained) and are generally predicted to occur in May*

at the beginning of the growing season. […] Most of the declines in ground water levels are predicted to occur in May when soil moisture conditions are typically favorable for supporting cottonwoods without dependence on shallow ground water levels. May in Fort Collins is typically the wettest month of the growing season with an average of 2.74 inches of precipitation (18 percent of the annual average) […] The combinations of relatively high precipitation and low temperatures at the beginning of the growing season provide soil moisture levels that could support cottonwoods without shallow ground levels compared to the rest of the growing season […] Some or all of the following effects may occur infrequently to cottonwoods […] when ground water levels temporarily decline below the estimated deepest annual water table depth of 6.85 feet for the cottonwood woodlands:

- *Delayed leaf out (lengthened dormancy at beginning of growing season)*
- *Yellowing and loss (abscission) of leaves*
- *Reduced branch growth*
- *Branch die-back*

"*Effects from the 1-2 ft stage declines and subsequent ground water level declines are predicted to be negligible.*"

Comment: The SDEIS states that Scott et al. (1999) concludes that a sustained decline in ground water levels of 3.1 feet results in 88% cottonwood mortality whereas the declines as a result of NISP can be as much as 2.5 feet and equate to no mortality, only "short-lived stresses." This conclusion is not valid.

This conclusion is explained by saying that "most" of the declines would be in the wettest month, May. However, there is no evidence to suggest that reducing the peak flow would have no adverse effect on cottonwood woodlands. It is true that cottonwood trees are more vulnerable to water stress when temperatures are higher, when the canopy if fully leaved-out, and when less of the root system is in contact with the water table, all of which occur late in the growing season. Depending on position in the riparian zone, trees positioned at higher and drier sites will be more vulnerable to a 2.5 foot decline in peak streamflow than those nearer to the river and at a lower elevation. The vegetation is distributed along a gradient; the gradient is driven by the hydroperiod, inundation frequency, and depth to groundwater (as well as variability in these factors). Reducing the peak flow by diverting large volumes of water in the spring will have an effect on riparian vegetation. (Poff et al., 1997). Unequivocal statements about the cottonwood forests responding in a unified and single way to flows result in incorrect and arbitrary conclusions. The analysis should be revised to more accurately reflect the effects of the removal of peak flows, as described above.

10.7.6 Failure to Analyze Ecological Services

Resources Report, Section 5.8.9, Other Ecological Functions Associated with Flooding

Statement: "[T]*he degree to which the ecological services are provided vary with frequency, duration, and extent of flooding and are not discussed in this technical report because they have not been the focus of scoping or comments on the NISP DEIS and can vary greatly from site to site.*"

Comment: The evaluation of environmental impacts includes any changes to the natural environment as a result of the Project. The reduction of peak flows in the Poudre River will diminish the provision of valued ecological services. The statement in the SDEIS that these processes can vary greatly from site to site is precisely why it is important to analyze them. SDEIS

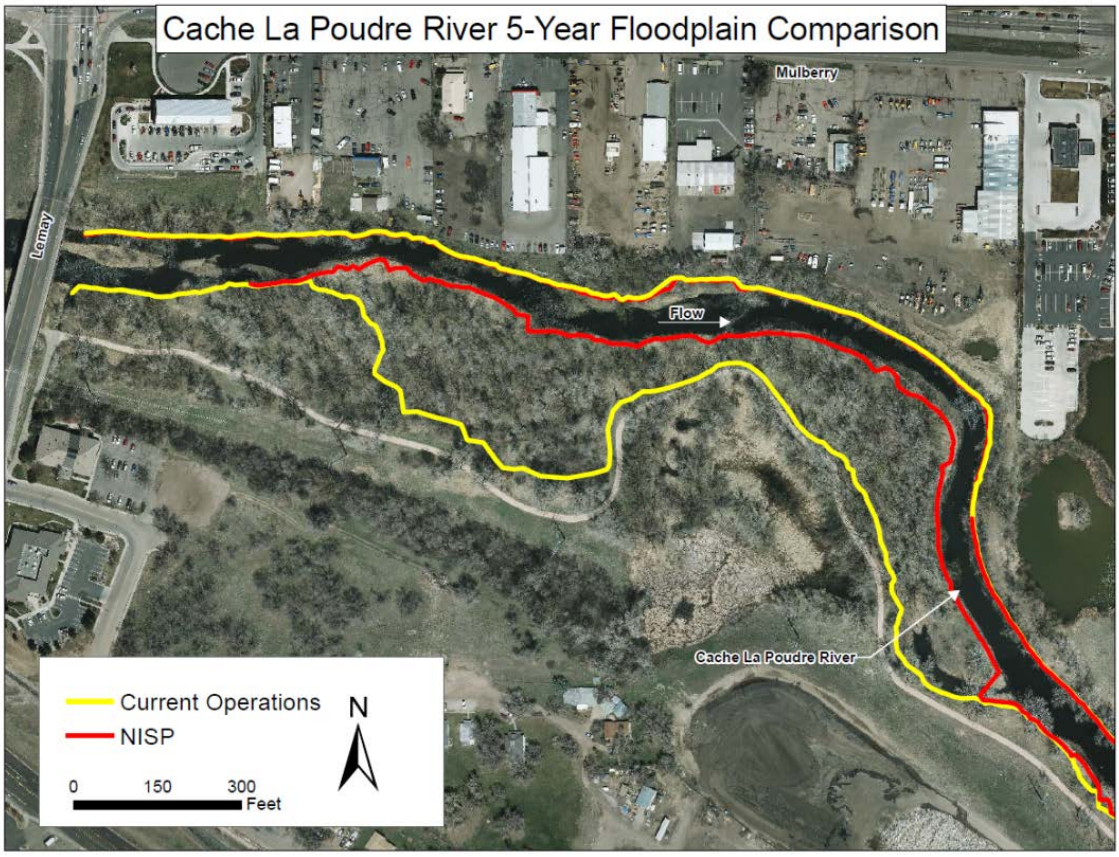
Section 4.9.4 describes this topic well and illustrates how ecological services are fundamentally important to river and riparian habitat dynamics. Understanding and disclosing how these ecological services would be affected are important aspects of the this NEPA analysis.

The areas inundated with a frequency at or greater than 20% of the time (the 5 year floodplain) could be considered as a possible surrogate for understanding changes to these services. The 5 year flow was used in both the RHAF and ERM Supplemental Report as an indicator of the positive relationship between important functions of the riparian forest and river-floodplain connectivity to moderate flows.

Fort Collins and its consultants calculated the 5 year flow at the USGS gage at the Lincoln St. gage using methods described in USGS bulletin 17b for historic, current conditions and Alternative 2 flow scenarios (see ERM Supplemental Report, Current Conditions and Alternative 2and USGS, 1982). Respectively this flow is 3,486, 3,018, and 2,366 cfs. According to these flow values, this "moderate flow" appears within range of flows most affected by the preferred alternative.

	Historic (3,486 cfs)	Run 1 Current Conditions (3,018 cfs)	Run 3a Preferred Alternative (2,366 cfs)	Percent change from Run 1 to Run 3a
Transition: (Canyon Mouth to Shields)	49.2	41.9	30.0	28.5
Urban: (Shields to Boxelder confluence)	86.4	70.5	56.5	19.8
Warm: (Boxelder to County Road 32E)	169.1	134.5	91.7	31.8

The first three columns in this table present the average width (in meters including both sides of the river) of the 5-year floodplain for three RHAF river segments under various 5 year flow scenarios. The percent change from Current Conditions to the Preferred Alternative can be calculated as a way to present the expected change in ecologic services. This methodology and these river segments, are explained the RHAF (City of Fort Collins, 2015a). Due to bank armoring and channel constrictions the riparian forest is narrow for significant lengths in each of these river segments. In contrast, the sections with more natural low-lying floodplain topography are more likely to receive the benefits of inundation. For example, as portrayed in the photo below, the river section downstream of Lemay Ave. currently inundates the forest under the 5 year flow. WithNISP the 5 year flow will not extend into the forest at all.



The analysis should be revised to provide a spatial assessment of inundation alterations and the effects to the riparian environment, as described above.

10.8 COMMENTS REGARDING WILDLIFE ANALYSES

10.8.1 Inadequate Analyses of Impacts to Wildlife

Comment: The SDEIS analysis for wildlife primarily addresses the direct impacts at or near the site of the reservoirs. Indirect impacts for wildlife along the Poudre River rely on the Riparian and Wetland analysis, which have weaknesses as discussed in this Section 10, and therefore are not a reasonable perspective from which to analyze impacts to wildlife. The general conclusion that the project would likely affect the overall abundance of wildlife but would not alter species composition and distribution; and that species would likely adapt to the new habitat conditions is not supported by any additional information and is inconsistent with fundamentals of wildlife biology. The wildlife analyses and conclusions should be revised, in conjunction with revisions to the wetlands and riparian area analyses, to address the deficiencies described above.

10.8.2 No Basis for Assertion of Adaption of Species

SDEIS Section 4.10.3.2, District's Preferred Alternative, Poudre and South Platte Rivers, Page 4-272

Statement: "*The predicted changes in vegetation would occur slowly over a long period of time and would likely be negligible and imperceptible given the dynamics of riparian areas. Wildlife using these habitats typically use a wide range of aquatic, wetlands, and riparian habitats and would likely adapt to the new habitat conditions that currently occur within the riparian areas of the rivers.*"

Common: The changes to the flow regime under the preferred alternative will begin abruptly once the Project is constructed and the ripple effect through the system will not be "slow" given plants, especially herbaceous plants, respond to real time conditions. There will be a slower response to woody vegetation, however drought stress could cause decadence to some stands within years rather than decades.

To say wildlife will adapt to the changes fundamentally mischaracterizes the expected outcome. As vegetation changes it is likely to cause a concurrent change in wildlife species composition and diversity. Species that "adapt to the situation" will likely be those species common to urban settings and not the suite of riparian dependent species.

The wildlife analyses and conclusions should be revised, in conjunction with revisions to the wetlands and riparian area analyses, to address the deficiencies described above.

10.9 COMMENTS REGARDING CUMULATIVE EFFECTS, AVOIDANCE, MINIMIZATION, AND MITIGATION

10.9.1 Complete Analysis Is Needed

SDEIS Appendix F
Conceptual Mitigation Plan

Comment: The adequacy of the cumulative effects and mitigation planning cannot be evaluated without better analysis of the critical factors discussed in this Section 10. The impacts to the riparian and wetland resources need to be quantified in order to address them. The SDEIS rationale that the impacts will be imperceptible, negligible, or minor and that Alternative 2 will accelerate and/or reinforce the well-established trajectory is not substantiated.

10.9.2 Current Proposal Omits Certain Needed Elements

SDEIS Appendix F
Statement: "*Proposed Conceptual Mitigation Plan …*"

Comment: The proposed avoidance, minimization, and mitigation described in the SDEIS lack certain required elements, such as peaks flows and other measures to specifically address the issues identified in this Section 10. The key missing elements of the current proposed approach are:

- Provision of peak flows to compensate for narrowing of all riparian flow related functions and wetland loss.
- Provision of long term management plans for improving river floodplain access as well as periodic manual scour (creation of bare sites) to support maintenance of future forests and resilience of native woody species.
- Provision of means to address the loss of critical ecological services associated with flooding in the riparian zone.

Peak flows are the cornerstone of riparian and wetland resources. Peaks flows therefore should be a central component to any plan to avoid, minimize, or mitigate the impacts. Any avoidance, minimization, and mitigation should also address the issues described above.

10.10 RESOURCES FOR SECTION 10

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APPENDIX A:
CITY OF FORT COLLINS' COMMENTS ON SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE NORTHERN INTEGRATED SUPPLY PROJECT

LIST OF SELECTED PREPARERS OF COMMENTS

1. CITY OF FORT COLLINS STAFF

Donnie Dustin, P.E. Donnie Dustin is the Water Resources Manager for the City of Fort Collins Utilities. His education includes a B.S. in Geology from James Madison University in Virginia and a M.S. in Civil Engineering (with emphasis in Water Resources Planning and Management) from Colorado State University ("CSU"). He is a registered professional engineer in Colorado and has been employed by the City of Fort Collins for approximately 17 years, 10 of which has been with the Utilities Water Resources Division. His duties and expertise include developing policies related to water supply system operations and development, and demand management. He has provided criteria and guidance related to hydrologic and water rights allocation modeling. He oversees the management of the City's raw water supplies including the administration of relevant water rights decrees. He also serves on the governing boards of two irrigation companies.

Keith Elmund, Ph.D. After serving as an officer in the U.S. Air Force, Keith came back to CSU and finished his Ph.D. in environmental microbiology. He has been with the City of Fort Collins Utilities for over thirty-five years and since 1984 has served as Environmental Services Manager. In this role, he manages both the City's certified drinking water quality and pollution control labs. Beginning in 2006, he helped implement the Poudre River Monitoring Alliance that was part of EPA's award winning "performance track" environmental leadership program. This ongoing program joins together the Cities of Fort Collins and Greeley, the Town of Windsor, the Boxelder and South Fort Collins Sanitation Districts, and Carestream Health, with CSU, the North Front Range Water Quality Planning Association and the Colorado Water Quality Control Division in a collaborative effort to monitor and help protect water quality in over 42 miles of the lower Poudre.

Cameron Gloss, AICP. Cameron Gloss is the Planning Manager for the City of Fort Collins. Since entering the field in 1984, his public and private sector experience includes an array of work including comprehensive community planning, subarea and neighborhood planning, transportation master planning, land development review, sustainability modeling, and the crafting of land use regulations. Prior to his most recent role with the City of Fort Collins, Cameron spent five years working with the Fort Collins offices of both AECOM and Clarion Associates where he acted as a Senior Planner, leading community planning projects over a dozen states, primarily within the western region. Mr. Gloss holds a B.S. in Geography (urban emphasis), Arizona State University, 1983. He is a member of the American Institute of Certified Planners.

Adam Jokerst, P.E. Adam Jokerst is a Water Resources Engineer for the City of Fort Collins Utilities. His education includes a B.S. in Biological and Agricultural Engineering from

the University of Arkansas and a M.S. in Civil Engineering from CSU. He is a registered professional engineer in Colorado and has been employed by the City of Fort Collins for approximately three years with the Utilities Water Resources Division. His main function at the Utilities is to provide hydrologic, water rights, and system modeling used to assess the Utilities' current and future water and infrastructure needs. In addition, he acts as project manager for the Halligan Water Supply Project. He is also knowledgeable in the areas of water resources engineering, planning and management and provides his expertise to develop policies, maintain and protect water rights, and provide water supply and use information.

Bonnie Pierce, Ph.D. Bonnie Pierce is an Environmental Data Analyst in the Fort Collins Environmental Services Department. Dr. Pierce's work for Fort Collins focuses on climate change and air, water, and hazardous waste matters including those related to oil and gas operations. Dr. Pierce is the City's project manager for the Poudre River Area and North College Ave. Innovation District Brownfields Assessment project. Her previous job assignments include Program Principal and Senior Project Manager for the Solid and Hazardous Waste Division for the Wyoming Department of Environmental Quality and Associate Director for Natural Resources, State of the Parks program, National Parks Conservation Association. Dr. Pierce received her Ph.D. in Soil Science from CSU.

Jill Oropeza. Watershed Specialist for the City of Fort Collins Utilities and Secretary/Reserved Seat Member of the Coalition for the Poudre Watershed. Jill has worked as the Watershed Specialist for the Fort Collins Utilities Source Watershed Program since 2007. The City's Watershed Program monitors water quality of the Upper Poudre River and Horsetooth Reservoir in collaboration with the City of Greeley and the Tri-Districts in effort to identify and address issues that affect drinking water treatment operations and watershed health. Jill holds an M.S. decree from CSU in Ecology and has over 12 years of experience working on natural resource issues in the state of Colorado.

Eric R. Potyondy, Esq. Eric Potyondy is an Assistant City Attorney in the Fort Collins City Attorney's Office. Mr. Potyondy's work for Fort Collins focuses on water-related issues, including water rights, water quality, and related matters. Prior to working for Fort Collins, Mr. Potyondy was in private practice in Colorado for nearly six years, with his practice focusing almost exclusively on water rights and related matters. Mr. Potyondy has litigated numerous cases in the Colorado District Courts for various Water Divisions and the Colorado Supreme Court. Prior to private practice, Mr. Potyondy worked for two years as the water law clerk for Hon. Chief Judge Roger A. Klein, District Court, Water Division 1, State of Colorado. Mr. Potyondy received his J.D. degree and his B.A. degree from the University of Colorado.

Kenneth C. Sampley, P.E. Ken Sampley manages the Water Utilities Engineering Division of Fort Collins Utilities consisting of a multi-disciplinary team of 13 employees that provide stormwater and floodplain management, flood warning and emergency preparedness, stormwater master planning, stream rehabilitation and stormwater water quality, development review for new stormwater, water and wastewater improvements, and water distribution and wastewater collection system capacity. Ken is a licensed professional engineer in the State of

Colorado and has over 34 years of experience. He worked for 3 years in consulting engineering, 26 years for the City of Colorado Springs, and the last 5 years for the City of Fort Collins. Ken graduated from CSU with a B.S. degree in Civil Engineering, specializing in hydrology and hydraulics. He obtained his M.P.A. degree from the University of Colorado.

Jennifer Shanahan. Jennifer Shanahan is an environmental planner for the City of Fort Collins, Natural Areas Department. Jen leads and participates a variety of planning processes related to management of the City's 42 natural areas with a particular focus on a spectrum of issues and projects surrounding the Poudre River. These include collaborative landscape-level planning, application of river science to policy and management, report development on integrative river models and monitoring projects, and communication of technical Poudre River issues to the broader community. She holds an M.S. degree from the Department of Forest Rangeland and Watershed Stewardship at CSU, with a research focus in riparian restoration.

John Stokes. John Stokes is the Director of the City's Natural Areas Department. The Department manages over 40,000 acres of conserved land, including approximately 1,800 acres along the Poudre River in Fort Collins. John is a member of the Colorado Water Institute initiative the Poudre Runs Through It, a regional collaborative group working on issues related to river health and water supply. In that capacity John has initiated an instream flow collaboration with various regional partners as well as an annual Poudre River Forum that has generated substantial participation from the community. John is a member of the South Platte Basin Roundtable as one of two environmental representatives. In 2014 John was recognized by the Colorado Water Trust with the David Getches Flowing Waters Award which recognized John's efforts to restore and improve Poudre flows.

2. OUTSIDE CONSULTANTS

Daniel Baker. Daniel Baker is a research scientist at CSU. In the summer of 2012 Dan completed a postdoctoral fellowship at Johns Hopkins University, working with the National Science Foundation-funded National Center for Earth Surface Dynamics and the Intermountain Center for River Rehabilitation and Restoration based at Utah State University. He completed his PhD in civil and environmental engineering in 2009 at CSU, with a focus on river engineering and stream restoration. Dan's research focuses on the interaction between physical and biochemical processes in streams, the effects of flow extraction on stream geomorphology and sediment dynamics, and the application of Geographic Information Systems (GIS) technology to evaluate reach-scale conditions from digital elevation models. Other current projects focus on developing urban stream restoration guidance with the USACE and monitoring post-fire sediments and aquatic insects on the Poudre River.

Brian Bledsoe. Brian Bledsoe is a professor of Civil and Environmental Engineering at CSU. Brian has more than 25 years of experience as an engineer and environmental scientist in the private and public sectors, including more than 20 years of experience in stream and wetland restoration. Brian's research and teaching are focused on watershed and river processes at the interface of hydrology and aquatic ecology. He has worked in the private sector as a consulting

engineer and surveyor, and for the state of North Carolina as a stream and wetland restoration specialist and nonpoint source program coordinator. Brian has served as a peer reviewer on recovery programs for the Platte and San Juan Rivers, the U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program (EMAP), as well as on numerous large-scale restoration projects including the Everglades and Louisiana coastal areas. Brian is a licensed professional engineer in Colorado and North Carolina.

Claudia A. Browne. Claudia Browne, is a Water Resources Specialist and the Southern Rocky Mountain Bioregion Leader at Biohabitats Inc. (since 2004), a national ecological consulting firm specializing in restoration, conservation planning and regenerative design. Ms. Browne has over 30 years of experience in environmental protection and water resource management with expertise in habitat assessments, riparian and wetland restoration and maintenance, groundwater monitoring well installations, surface water and groundwater data collection and evaluation, wetland permitting soil sampling and data evaluation, point-flow analysis, water budgets, conceptual hydrogeologic model development, and groundwater modeling. Ms. Browne has been the Project Manager for the Fort Collins Wetland and Riparian Restoration On-Call contract since 2008. As such, she has participated in a wide range of City's river projects including assisting with the Poudre River Management Plan update; assessing the groundwater-surface water regime for multiple properties, and; restoration planning efforts including prioritizing potential restoration projects, identifying focal species and habitat types, and helping develop restoration concept plans. Ms Browne is also providing ecological master planning assistance for the Poudre River Downtown Master Plan for the City. Her role has included developing habitat goals and objectives for 10 miles of river through the City's urban core, mapping priority habitat areas, collaborating with wildlife biologists and stakeholders, and identifying opportunities and constraints. Ms. Browne received her B.S in Natural Resources from Cornell University and her M.S. in Ecology from CSU.

Jordan Furnans, Ph.D., P.E., P.G. Dr. Furnans is a Senior Water Resources Engineer with INTERA Incorporated, and engineering and geosciences consulting firm in Austin, TX. Dr. Furnans holds a PhD in civil engineering and an M.S.E. degree in environmental and water resources engineering, both from the University of Texas at Austin, and a B.S.E. degree in civil and geological engineering from Princeton University. Dr. Furnans has 16 years of professional experience that encompasses both field hydrologic data collection and the analysis of data through the development and application of numerical models. He specializes in the areas of water right accounting; coupled field and model hydrodynamic investigations of estuaries, lakes, and rivers; linking water quality and hydrodynamics in natural systems; water availability modeling; watershed hydrology planning and management; hydrographic and sedimentation survey methods; and freshwater inflow and instream flow requirements for ecosystem health. Some of Dr. Furnans' recent experience includes developing expert testimony for water rights litigation efforts, accounting plan development and water rights analysis, performing model reviews, developing an automated bathymetric data processing system for volumetric and sediment surveying, aiding development of instream flow recommendations for rivers in Oklahoma, and modeling circulation in lakes.

Andrew Herb. Mr. Herb, owner of AlpineEco (founded in 2007) has worked as an ecologist in the Rocky Mountain Region for over 16 years. Although most of his work has been in Colorado and Utah, he has worked in nearly all the Rocky Mountain, Great Plains, and Great Basin States, as well as in Korea, Japan, Guam, and Puerto Rico. His work involves most aspects of field ecology, with a focus on wetlands. He is currently the president of the Rocky Mountain Chapter of the Society of Wetland Scientists, which is an international organization committed to improving the management of wetlands through sound science and education. He is also the founder and chairperson of SWS's Wetland Restoration Section, which brings together professionals from around the world to share information on wetland restoration. His commitment to science and the environment, combined with his practical approach to problem-solving results in creative, cost-effective, and ecosystem-friendly approaches to projects. Mr. Herb is also the owner of AlpineEco Nursery (founded in 2012) which provides native wetland and riparian plants for ecological restoration.

William Lewis, Jr., Ph.D. Dr. Lewis is professor and Director of the Center for Limnology, University of Colorado Boulder, and serves as Associate Director of the University of Colorado at Boulder Cooperative Institute for Research in Environmental Sciences. His interests in research and teaching include ecological characteristics and processes of inland waters (lakes, streams, and wetlands). Research for Dr. Lewis and his students focuses mainly on biogeochemical processes, ecosystem modeling, effects of water pollution and hydrologic changes on aquatic ecosystems and organisms, composition and abundance of aquatic organisms under natural and anthropogenically altered conditions, and productivity of aquatic ecosystems. Dr. Lewis has published over 200 journal articles related to these research interests. He is recipient of the Renewable Natural Resources Foundation Sustained Achievement Award and of the Baldi Award and the Naumann-Thienemann Medal of the International Society for Limnology. He has served as a member of the Board on Environmental Studies and Toxicology and on the Water Science and Technology Board of the National Academy of Sciences National Research Council.

John Putnam, Esq. John Putnam is an attorney and partner at the law firm of Kaplan Kirsch & Rockwell, LLP, in Denver. Mr. Putnam's practice emphasizes counseling and litigation for public and private entities on complex issues of environmental law, especially for large public and public/private projects. Mr. Putnam has extensive experience providing clients nationwide with strategic advice on large and controversial development and transportation projects, including airports, highways, real estate development, telecommunications facilities, and other infrastructure. He counsels clients regarding a wide range of environmental, transportation and development issues, including the National Environmental Policy Act, wetlands, air quality, climate change, sustainability, air toxics, noise, tolling and innovative finance, land use, endangered species, floodplains, municipal law, transportation regulations and Native American jurisdiction. Mr. Putnam received his J.D. degree from the University of Chicago and his B.A. degree from Williams College.

Jennifer Roberson. Jennifer is a professional research assistant with the Center for Limnology at the University of Colorado Boulder, within the Cooperative Institute for Research

in Environmental Sciences. Her duties include data assembly, data analysis, and synthesis of information for reports and publications of the Center for Limnology. She holds a Bachelor's Degree in Ecology and Evolutionary Biology from the University of Colorado Boulder and has extensive experience in fieldwork, laboratory analyses, data analysis, and document preparation related to water quality, aquatic life, water quality regulations and related matters specifically for Colorado.

APPENDIX B:
CITY OF FORT COLLINS' COMMENTS ON SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE NORTHERN INTEGRATED SUPPLY PROJECT

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